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The New Augsburg's Drawing

EIGHTH YEAR BOOK

A Text Book to be Placed in the Hands of the Pupils of the Eighth Grade

BY

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GENERAL STATEMENT AND PLAN

The three great mechanical mediums through which we formally acquire and express thought are:

Language, the medium of communication.

Number, the medium of measurement, and

Drawing, the medium of form and color.

These three mediums or studies are fundamental in character, largely mechanical in construction, the elements are taught and learned more or less mechanically, and are the basis of all other branches.

The esthetic element is common to all of these mediums, in language as poetry, in number as rhythm, and in drawing as the artistic. This esthetic element is gained largely through absorption. The artistic, which is the esthetic element of drawing, cannot be taught in the direct manner of the mechanical elements, but is gained more slowly as the principle and the mechanical processes are learned. The mechanical elements of the above studies can be taught by all teachers and learned by practically all pupils, and during this process of teaching and learning the esthetic elements are more or less absorbed.

Drawing. Of the above studies drawing is the common means of expressing the great world of form. It is the form medium of the arts and crafts, the sciences, the engineering professions and the universal language of human industry. Its primary aim is:

To teach form.

And its secondary aims are:

The teaching of the art of representing form, including color, on a flat surface.

The development of skill, speed and freedom in the use of the hands; and

The giving of a form medium through which the imitative, constructive and esthetic instincts and powers may be developed.

The Fundamental Elements of Drawing. Drawing has its fundamental processes or elements, very much the same as number. We speak of the addition of number, the subtraction of number, the multiplication of number and the division of number. In very much the same way we may speak of the *Position* of form, the *Direction* of form, the *Shape* of form, and the *Proportion* of form.

Position, Direction, **Shape** and **Proportion** are the fundamental elements of drawing. These elements are largely mechanical, and through them the mechanical processes of drawing are taught.

Position relates to the *placing* of objects in the drawing. It includes *perspective* or the placing of objects different distances away; and *composition* or the arrangement of objects in a pleasing group.

Direction relates: To the kinds of lines used in drawing and to the surfaces represented by these lines; to the action expressed by lines as seen in growth, in inanimate form, in animate form and in rhythm, and to the expression of lines.

Shape relates to the form inclosed by lines. To the triangles, rectangles, circles, ellipses and ovals, and to their use in giving shape to the prisms, and a basis to form and design.

Proportion relates to the size, to the relative size of objects and parts of objects; to how large and how small objects should be by comparison.

These four elements run through the entire subject of drawing, dividing it, for the convenience of teaching and learning, into four divisions that include practically all the difficulties of the art. This is illustrated graphically in the following outline.

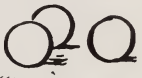
THE FUNDAMENTAL ELEMENTS OF DRAWING ARE POSITION, DIRECTION, SHAPE AND PROPORTION

POSITION IS PLACING OBJECTS. EVERY PART MUST HAVE ITS PLACE

PLACING THEM DIFFERENT DISTANCES AWAY AS IN

PER-SPECT-IVE →

AND ARRANGING THEM IN A PLEASING GROUP AS IN COMPOSITION →



DIRECTION RELATES TO THE LINES USED IN DRAWING TO THE UNACCENTED LINES { LIGHT → MEDIUM → and HEAVY →

TO THE ACCENTED LINES { GRADED → EMPHASIZED and BROKEN →

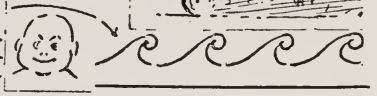
DIRECTION RELATES TO ACTION TO THE ACTION OF LINES

AS SHOWN IN GROWTH →

IN INANIMATE FORM →

IN ANIMATE FORM

IN RHYTHM AND THE EXPRESSION OF LINES



SHAPE INCLUDES THE MEASURES OF FORM

THEIR USE IN DESIGN

IN FLAT DRAWING

IN PARALLEL DRAWING

IN OBLIQUE DRAWING

IN MECHANICAL DRAWING

AND IN DECORATIVE DESIGN

PROPORTION RELATES TO THE RELATIVE SIZE OF OBJECTS

The Branches of Drawing. Drawing is divided into Free Hand Drawing, Mechanical Drawing, Decorative Design and Color.

Free Hand Drawing shows the appearance of objects. It is the art of representing objects in picture form and is divided into Flat Drawing, Parallel Drawing and Oblique Drawing.

Mechanical Drawing, or Constructive Drawing, as it is often called, shows the facts of form in such a manner that the object can be constructed from the drawing. It gives not only the fundamental elements of drawing, but the material element also. Mechanical Drawing is divided into Projection Drawing, Cabinet Drawing and Isometric Drawing.

Decorative Drawing relates to the ornamentation of form and the designing of articles for decorative purposes.

Color is common to all of the above branches. It is taught separately because ordinary drawing is rendered in black and white, and the methods of painting are different from drawing.

In the outline on the opposite page, Drawing and its branches are arranged in a logical manner for teaching. It gives *first*—the subject, *second*—the lowest grade in which the subject can be taught to advantage, and *third*—the time of year that seems to give the best results. The plan is a guide until experience gives a better.

It will be seen that in a general way the work is divided into:

Object drawing which comes in the autumn.
Formal drawing which comes in the winter, and
Color drawing which comes in the spring.

Object drawing is general, comes every year, and is more convenient to teach in the fall of the year when objects are plentiful and easy to procure.

Formal Drawing is special. It includes the teaching of method, principle, and the technical elements that enter into drawing as an art, and aims to give the best result in the easiest way. Formal drawing should be given preference, in length of period and amount of time.

SUBJECT	WHERE TAUGHT	WHEN TAUGHT
Object Drawing	Taught in each year	Fall
Position		
Placing	1 and 2 years	Winter
Perspective	1 and 2 years	Winter
Composition	3 and 8 years	Winter
Direction		
Lines	1, 2, 3 and 4 years	Winter
Surfaces	2 year	Winter
Action of growth	3 year	Winter
Action of inanimate form	4 year	Winter
Action of animate form—birds	5 year	Winter
Action of animate form --animals	6 year	Winter
Action of animate form—human figure	7 year	Winter
Action of animate form—human face	8 year	Winter
Action of Rhythm — Rhythmic Exercises	1, 2, 3, 4 and 5 years	Winter
Decorative design	5, 6, 7, and 8 years	Winter
Proportion		
Relative size of objects	3 year	Winter
Form		
Triangles and rectangles	3 year	Winter
Circles, ellipses and ovals	3 year	Winter
Triangular and rectangular prisms	4, 5 and 6 years	Winter
Cylinders and spheres	7 and 8 years	Winter
Flat Drawing	1, 2 and 3 years	Winter
Parallel drawing	4 and 5 years	Winter
Oblique drawing	6 year	Winter
Mechanical drawing	7 and 8 years	Winter
Color		
Colored Crayons	1, 2 and 3 years	Spring
Water colors — Object painting	4, 5, 6, 7 and 8 years	Spring
Tints and shades	4 year	Spring
Hues and complementary tones	5 year	Spring
The Graded wash	6 year	Spring
The Broken washes	7 year	Spring
Light	8 year	Spring

Color work may be used at any time as a medium, but the teaching of color is, perhaps, more convenient in the spring.

Object drawing and object painting may be one.

The tools used in this drawing are those of universal use and application; they are the crayon, the lead pencil, the pen and the brush. The first two are tools and mediums in one.

The Crayon is the medium of freedom. Its range of utility is small, but for first efforts in drawing this is a desirable quality. Its economy, the ease with which it is applied and removed from the blackboard, the freedom, the large lines are all well adapted to the growing needs of the child and if rightly directed will impart ease, freedom and skill in the use of the hands.

The Lead Pencil, next to the crayon, is the most serviceable tool for work in the public schools. It has few faults and many excellent qualities, is ever ready for use, of an agreeable tone, and approaches the crayon in freedom and ease of application.

The Pen is the tool of precision. It represents the perfection of line drawing with ink as a medium, is permanent, exact, and is largely used in commercial drawing or work that is translated through the line.

The Brush is the tool of color. It is, perhaps, the greatest of tools and has the widest range of utility. In obedience to the guiding mind it is delicate or strong, fine or broad, soft, elastic, rapid and precise. A tool of such wide utility must of necessity have greater mechanical difficulties in its mastery, and this is its chief objection for use in the lower grades.

The Blackboard. There is no place equal to the blackboard for drill exercises in drawing. The largeness of the surface gives freedom, its publicity stimulates to effort and creates confidence, and the teacher can direct the work with the minimum of time and of effort. Economy, efficiency, freedom, and rapidity characterize blackboard drawing.

The Drawing System consists of eight books — one for each year, or grade. The number of the year corresponds to the number of the grade.

Thus the First Year Book covers the first grade, the Second Year Book the second grade, and so on.

In the First, Second and Third Year Books the text is addressed to the teacher and the drawings to both teacher and pupil.

LEADING FEATURES OF EIGHTH YEAR DRAWING

Object Drawing. Group drawing, Compositon and Section drawing are the leading elements.

Direction. The Human Head and the Expression of the Human Face are given in this book, and Decorative Design is concluded.

Form. The Sphere, Reflections, and Mechanical drawing are the main features.

Color. Light is the additional work in color.

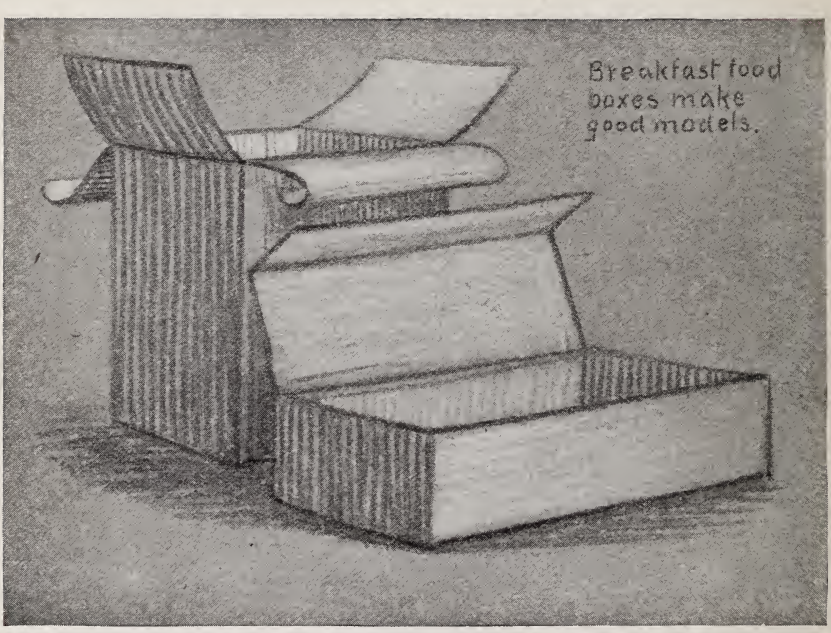


Fig. 1

THE NEW AUGSBURG'S DRAWING

EIGHTH YEAR BOOK

OBJECT DRAWING

In learning the art of drawing three phases of the work need to be recognized. These are, drawing from the object, drawing from the copy and drawing from the memory and imagination. These phases are mutually helpful and should go hand in hand.

In drawing, we reproduce, say a couple of breakfast food boxes, similar to those in Fig. 1. The boxes themselves are the source of the drawing — they are the objects. The copy represented by Fig. 1 shows how to represent the original objects, and the memory and imagination are the test of how well we have learned them and our ability to use them in various ways. The source (object), the how (copy) and the test (memory and imagination) make the learning complete. The object is the **perfecting element;** the copy the **explaining element,** and the memory and imagination the **measure element**, showing how much knowledge we have gained.

The Object and the Copy. The object tells what to draw, the copy how to draw it.

The object or model is the source of the mental image, the copy shows how to represent this mental image in picture form.

The object gives ideas of form and color, of position, direction and proportion, of material and construction, and the copy shows how to represent these on a flat surface.

The object gives the idea to be reproduced, the copy gives the mode, the technique, the method, of how the idea is to be reproduced. There is nothing in the object or model that shows how to represent it in picture form, this is done through the copy — through the drawings made by others. The copy represents an art, and this art has been a growth, handed down to us through past experience.

Fig. 2

Imitation. We cannot draw all that we see, nor represent the object exactly as it appears to the eye. Imitate as closely as we will, our efforts will be found merely relative, when compared with the real object. In Fig. 2, there is a brush drawing of an oak tree. One could not call it an imitation and yet it looks like an oak tree. The oak tree has not been imitated exactly as it appeared, but it has been translated, translated in black and white by means of black ink and a brush. It could be translated in outline, with few lines or with many. It could be translated with a pencil, or crayon, with light and shade, or with color, but not as fully or completely as the real model. The real tree is the model to stimulate and perfect our idea or thought, but the manner of reproducing the tree rests entirely with the one who is making the drawing.

We can draw the object in any manner we wish and by any medium we may choose, we can represent it with few lines or many, completely or suggestively, in mass or in outline, in color, or in black and white,

in perspective with parallel or oblique drawing, or without perspective, as in flat drawing. It can be represented in mechanical drawing as a section, a projection, as isometric or as cabinet drawing. The whole question is determined by the wants of the draughtsman.

Fig. 3

Objects Suitable for Drawing. In general, objects suitable for first efforts in drawing are plain and simple objects, crudely formed objects, old and broken objects, and many natural objects.

Plain and simple objects are easy to understand, which is a strong factor in their successful reproduction. Crudely formed and finished objects require little skill to fashion them and in consequence are easier to reproduce in drawing. Old and broken objects are more interesting than new and whole objects, much of their skilled accuracy is worn away,

and the interesting element of use is seen to better advantage, besides they are easier to procure.

Decorated objects, delicately formed and finished objects, and complicated objects are generally not suitable for first efforts in this work. The objects used in this book have been successfully used for models in the class-room.

Collecting objects for drawing requires both thought and patience. A suitable collection is, perhaps, the most important element of success in object drawing. The teacher and pupils should work together to get the best collection possible.

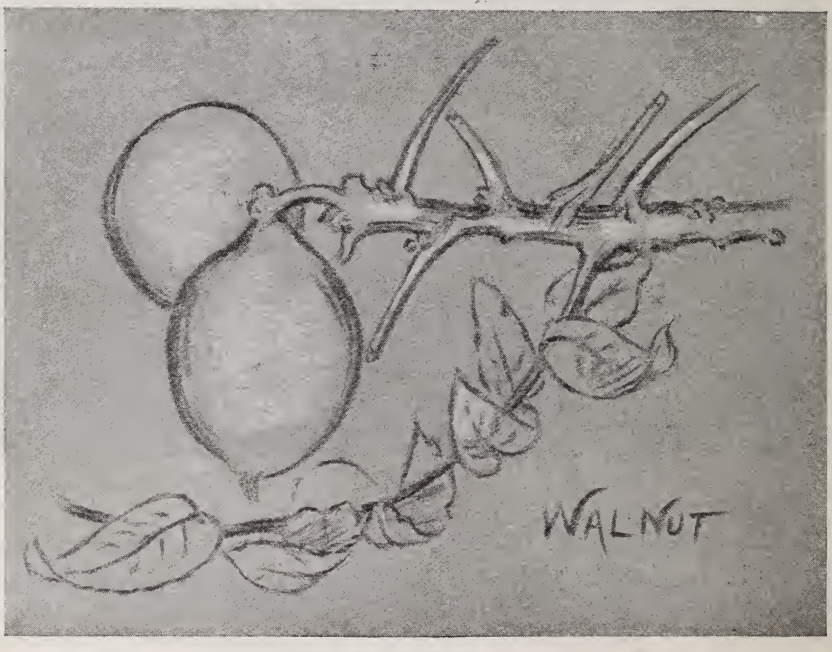


Fig. 4

Preparing Objects. Most natural objects need to be made more simple before being used as models. This is done by reducing the number of parts, and by removing many of those that are foreshortened.

Confusion should be avoided. Look at the object, and if to you it appears confusing, note where confusion is and remove it. The crossing of lines, many parts crowded together, and angular directions, are the chief causes of confusion.

In Fig. 4 note how the leaves have been removed from the walnut branch, and the crossing of lines avoided. One of the leaves has been left on to show how the foreshortening and the crossing of the lines in the leaflets lead to confusion.

Small objects such as nuts, fruit, small vegetables and shells may be placed at the back of the desk in an L shape background and when drawing at the blackboard they may be held in one hand and drawn with the other.

When the objects are large like a basket, hat, pumpkin, or in a group, then they should be arranged on a vacant desk. All objects should rest on a level surface. It is not necessary for all to draw from the same kind of object. Students should be taught to place their own models. An object should be at least three times its height away from the one drawing it. It may be placed farther than this, but if nearer, it may appear distorted.

The size of the drawing is usually determined by the size of the paper on which it is made. A pencil drawing should be three or four inches long and a blackboard drawing twenty inches. It is better to make the drawing large.

How to Study Objects. Much more will be gained by choosing one good object and drawing it several times, or until interest begins to wane, than to draw from a new object each lesson. It is better to draw one object seven times than seven objects one time. Quality is more than quantity. Success and not variety is the key to interest. Students love to do that which they can do with some measure of success rather than take up new lines of work. They do not tire of an object so long as they feel that they are gaining power.

Do not try to represent everything. Ask yourself the question, What am I drawing? Say a gate, Fig. 5. Is it necessary then to represent the rocks, the bushes and the distant hills beyond? No, not unless you want them in your drawing. You have the power to reject anything you do not care to have in your picture.

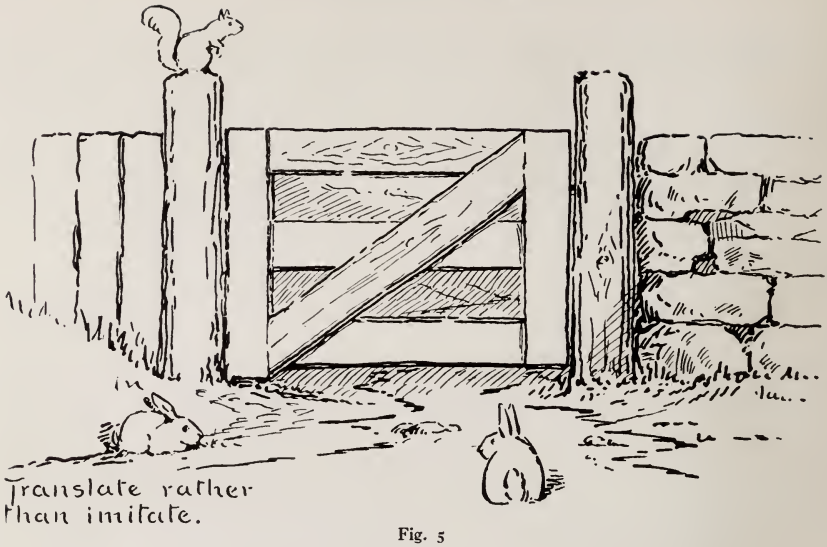


Fig. 5

Methods of Measuring. Method is an orderly way of doing. It is an aid to the judgment, but should in no way take the place of the judgment. Simply knowing the method will not enable one to draw, but it is a great aid in helping to construct the drawing in a systematic manner. Method saves time and enables one to accomplish results rapidly and with the minimum of effort and time. Method is a tool to work with the same as a pencil, only less material; it is the how of drawing.

Measuring with the pencil is a device or aid in determining directions, comparing lengths and verifying the position of points. The following are examples:

Measuring is to find out on the object, by means of the horizontal edge of the pencil, whether a point is above or below another point. For example, in A, Fig. 6, whether the top of the handle H is above or below the rim E on the real object.

Measuring is to find out by means of the vertical edge of the pencil whether a point on the object is at the right or left of another point. As for example, whether point D is at the right or left of point G and how much. Whether K is at the right or left of J.

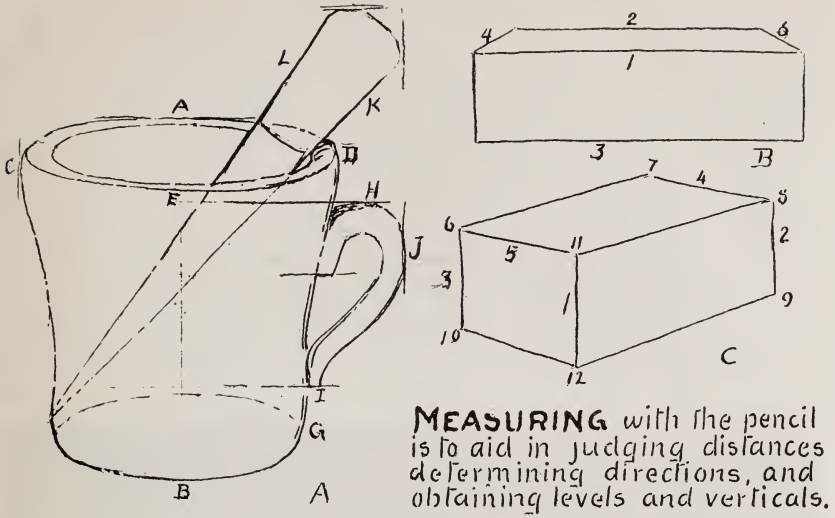


Fig. 6

Measuring is to determine the direction of lines. For example, continue with the edge of the pencil the line K and note where it crosses the edge of the mug. Continue the line L and note where it crosses the edge of the mug. Now by marking where it crosses the edge of the mug, the direction of the lines is readily gained.

Measuring is to determine the relative length of distances. For example, to compare the height A B with the width C D, the width C D with the width A E.

Measuring is done by holding the pencil at easy arm's length away, closing one eye, and letting the upper end of the pencil be even with the top of the object to be measured and with the thumb marking the lower end. For example, let the upper end of the pencil be even with A and with the thumb mark the lower end B. This is not the real height of the mug, but is a proportional height with which the width or any other distance may be compared.

Place a book or box before you in the position of B and by measuring with the pencil, see which measures the longer, edge 1 or edge 2; compare the distance between edges 1 and 2 with the distance between edges 1 and 3. With the edge of your pencil, find out how much edge 4 slants. Edge 5.

Place the book or box in the position of C and find out which is the longer, edge 1 or edge 2. Edge 2 or edge 3. The distance between edges 1 and 3 or between 1 and 2. Find out by using the horizontal edge of the pencil whether corner 6 is above or below corner 12. Find out by means of the vertical edge of the pencil whether corner 7 is at the right or left of corner 11.

Compare the height of a tree near by with one farther away, the height of the first telegraph pole with the next. Compare the height of the blackboard, picture frame, and map with its width. Compare distances (proportion), take slants (direction), find levels (horizontals), and find plumbs (verticals) until these aids are learned so they can be used with some degree of effectiveness.

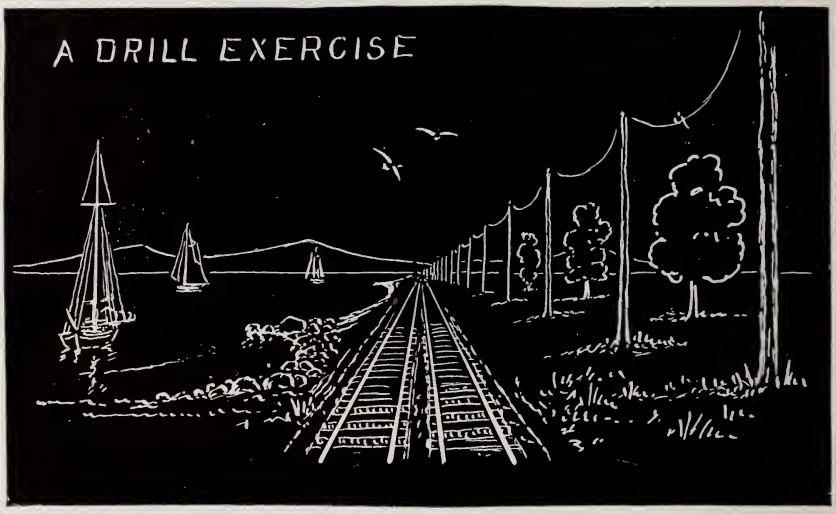


Fig. 7

Receding Distances. Measuring is most valuable as an aid in judging receding distances. In Fig. 7, the telegraph poles are the same height. Measure by laying your pencil on the drawing and compare the height of the fourth pole with the third, then with the second, then with the first, and note the difference in length.

The poles are approximately the same distance apart. Measure the distance with your pencil, the actual distance between the fourth and third poles, then between the third and second, and then between the second and first.

The trees are the same height. Measure with your pencil the height of the farthest tree and compare it with the height of the nearest tree. The boats are of the same height. Compare the height of the farthest one with the middle one and then with the nearest one.

The railroad tracks are apparently the same width. Measure with the pencil the width of the tracks opposite the fourth telegraph pole with the width opposite the nearest pole. It is these receding distances that measuring is most helpful in determining.

Fig. 8

The General Method of Drawing Objects. Perhaps the most direct and masterly way of drawing objects is to look carefully at the object. Study it. Then with light lines mark in the general form, then the position and proportion of each part, at the same time giving special attention to the direction of the lines, as shown in A, Fig. 8, and then finish as in B. The group of rocks C may be drawn in the same manner. This is the most direct way and the one toward which the learner should strive, but in the meantime, there are many little methods and devices that are helpful in assisting the judgment and which can be used as occasion arises.

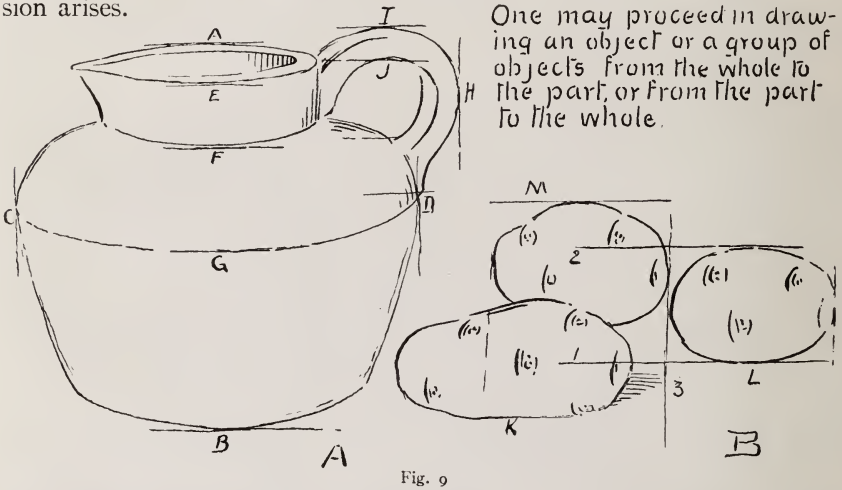


Fig. 9

Special Methods of Drawing Objects. There are two special methods of drawing objects and groups of objects, both of which contain features that are very helpful. In one, the drawing proceeds from the whole to the part, and in the other from the part to the whole. The first is as follows:

First — Take the length or height of the object, or group of objects.
Second — Find the width.
Third — Find the prominent points.
Fourth — Lightly mark in and finish.

For example, place say a jug before you as in A, Fig. 9. Take the

length of the jug A B as long as you wish the jug to be. Mark the point C as far as you wish the jug to extend to the left, and then find the width C D by measuring with your pencil and comparing the height with the width.

Mark the prominent points such as the width of the bottom, the points E, F and G, the top of the handle I, the lower end D and the width H. Do this largely with the unaided eye, though one may use the edge of the pencil as a horizontal and a vertical guide to tell whether one point is above or below another, as for example, whether the point I is above or below the point A. A point may be located very accurately by concentrating the mind on it. We fail when we try to draw and locate points at the same time. Last, mark in the outline lightly and finish.

The potato group B may be drawn in the same manner, or it may be drawn by the second method; that is, proceeding from the part to the whole, as follows: *First* — Draw the nearest object or the nearest part of the object. *Second* — Draw the second object by comparison with the first. *Third* — Draw the third object by comparison with the first and second, and so on.

In group B, draw the nearest potato K. Then using it as a unit of measure draw the second potato L. The horizontal and vertical lines indicate how to hold the pencil to find out the position of the other members of the group. For example, to find the resting place of L, pass the pencil horizontally through the lower point of potato L and note where the pencil crosses potato K, say at line 1. Mark this point in the drawing and draw line 1, and it will mark the lower edge of potato L. To find the top of potato L, pass the pencil through the top and note how far above potato K it comes. Mark this point as at 2 and draw a horizontal line which will mark the top of potato L. To find how far to the right the potato is, pass the pencil vertically through the left end and note how far the pencil comes from potato K. Mark this point as at 3 and draw a vertical line, which will mark the left edge of potato L. It is not necessary to find all the points, two or three are enough when the object may be drawn off-hand.

The method is simply one of limitation, finding how high up, how far down, how far to the right or how far to the left a point is compared with one already found.

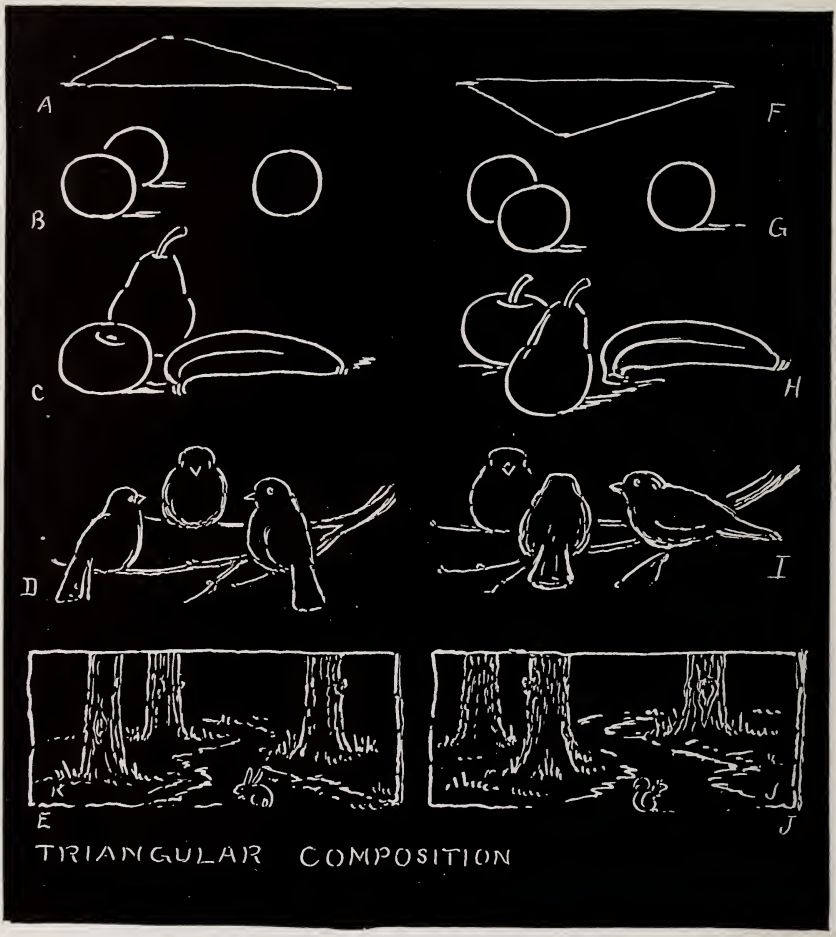


Fig. 10

Composition is placing objects in a pleasing group, hence it is a branch of the element Position. Triangular compositions are in general the most pleasing. Objects arranged in a triangular space, if in good proportion, are generally of pleasing arrangement. In Fig. 10, there are two triangles A and F. The apex of triangle A points upward and that

of F downward. Below each triangle there are four groups of three objects each, arranged similar to these triangles; that is, an object is placed on each corner of the triangle.

In studying composition it is well not to use more than three objects. The architect speaking of masses, says, "one is pleasing, two are pleasing three are pleasing, but four are confusing," and it is very much the same in managing four objects in composition. In E and J, Fig. 10, the trees rest in a triangular space, E similar to A, and J similar to F.

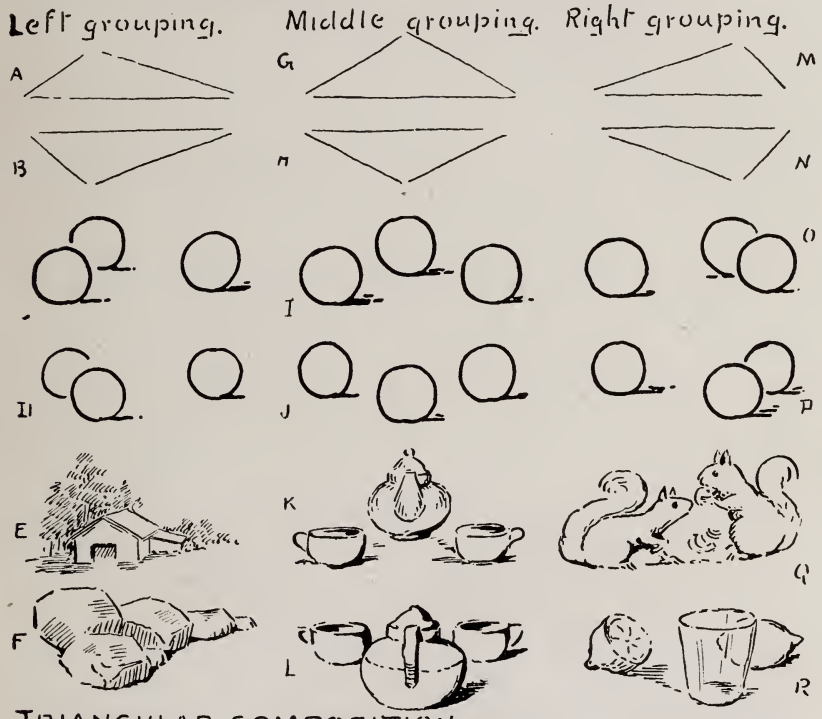


Fig. 11

For convenience in recognizing the groups they may be divided into left, middle and right grouping, as shown in Fig. 11, according as the apex of the triangle is at the left of the center, as in A and B; at the

center, as in G and H, or at the right of the center, as in M and N. The triangles themselves may vary from low obtuse triangles to high acute. These triangles are suggestive — they are suggestive of an agreeable form of grouping and as such are not to be taken as a literal rule in which the triangle is drawn out formally and filled in promiscuously. They merely suggest to the mind ways in which the group of objects may be arranged to give a pleasing result.

A, G and M are three triangles with the apexes pointing upward and C, I and O are balls arranged in a similar group on them, and E, K and Q are similar compositions with other objects.

B, H and N are three triangles with the apexes pointing downward, D, J and P represent balls in similar groups, and F, L and R are other objects arranged in the same manner.

Figs. 10 and 11 are to show you how you can arrange your own groups on the desk or table in an agreeable composition.

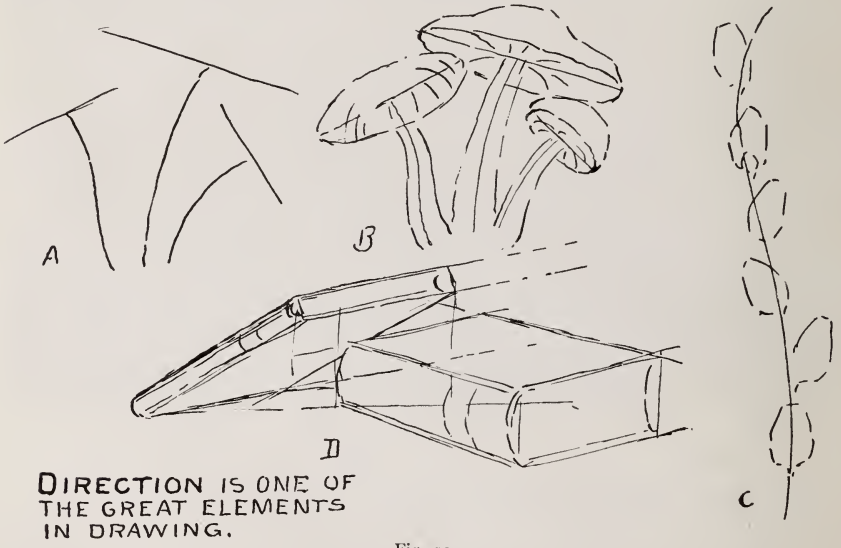


Fig. 12

Direction is one of the fundamental elements of drawing and should be carefully studied in the drawing of objects. Growth, action, grace,

and relation are shown by direction. The importance of direction is generally underestimated and often overlooked entirely in the drawing of objects.

As in Fig. 12, it is well to mark in directions with single light lines before marking in the form. The lines in A give the direction of the stem and the top, which is a strong aid to marking in the form as in B. It is well to indicate the direction of the limbs and trunks of trees, the stems of flowers and plants, and such objects, with a single line before marking in the form and proportion. C shows the branch of a pussy willow, the single line shows the direction of the stem and on it are marked the positions of the pussies.

It is in angular drawing that direction seems to give the most trouble. In such drawings as D the direction of lines are puzzling The only remedy for this is to learn the principle of oblique drawing; then such problems are simple. Oblique drawing is taught in the Sixth Year Book.

Sections. There is no kind of drawing that tells so many facts about an object as a section drawing. By means of a section drawing the inside of an object is shown. We can show how a spring is formed, show the bed of a lake or river, the formation of a valley, how the bud grows, and the seed is formed. We can show where the squirrel lives, where the frogs and turtles stay in winter, and how the muskrat builds his house.

A lengthwise or longitudinal section is a section drawn in the direction of the longer axis, and a cross or transverse section is a section cut at right angles with the lengthwise section. Vertical section and horizontal section are terms often used in place of lengthwise and cross sections, when the object will admit of such a distinction.

The conventional way of representing sections in mechanical drawing is by means of cross lines as shown in the section of the box H. Observe that different pieces, as the cover and body of the box, are represented by different angles in the cross lines. Outside of mechanical drawing, more liberty may be taken with this drawing and the sections represented in such a manner as to bring out the idea and make it plain. In Fig. 13, the sections are drawn in a variety of ways. The sections

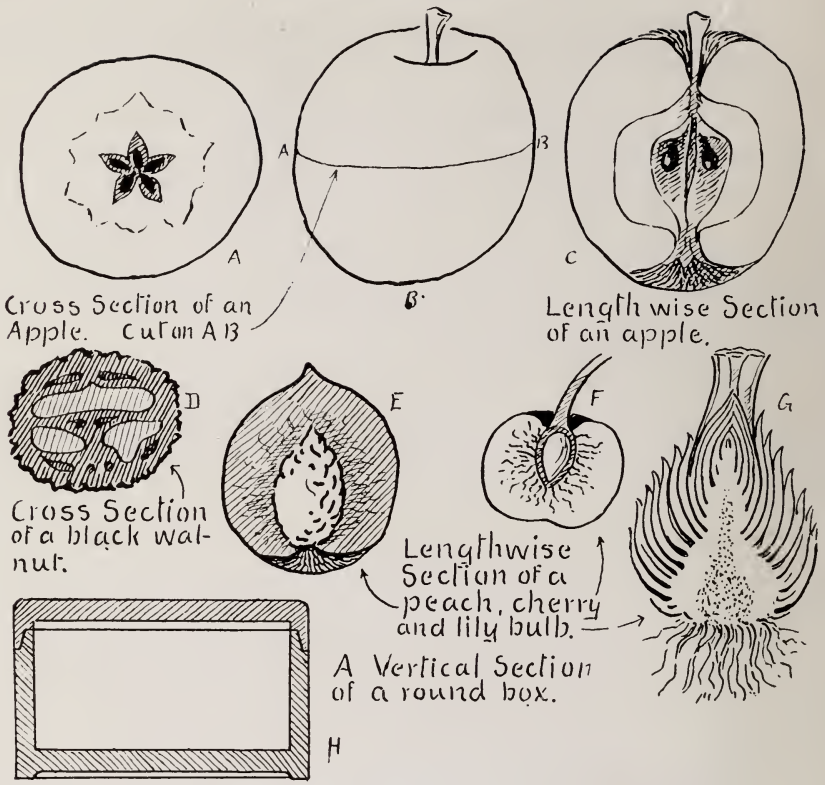


Fig. 13

of the apple A and C are not cross lined at all, while the cross section of the walnut D is lined completely. In the peach E a section is shown of the flesh part of the peach, but the stone is left whole, . . . in the cherry the flesh is not lined, but the shell is, and the kernel left whole.

A section may be drawn in whole or in part, or in any way that the draughtsman may desire to make his idea plain.

The source of section drawing is the object. The object is cut in two with a knife or fine saw and a drawing made of the cut-off section. The following objects will be found serviceable for this purpose:

Vegetables, such as the carrots, radishes, cucumbers, onions, peppers, gourds and like objects.

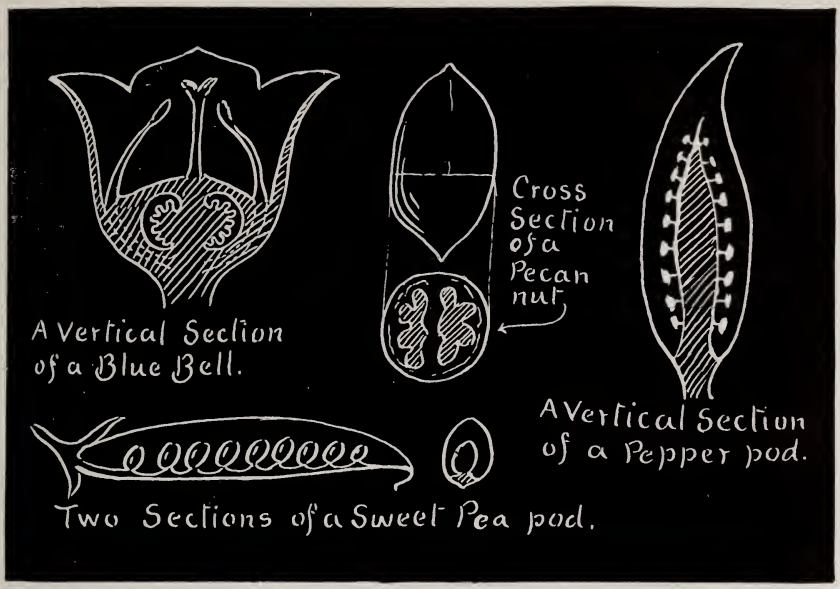


Fig. 14

Nuts, seeds and seed pods make fine models after they have been cut, broken or sawed apart.

Fruits are among the most available models for this purpose.

Buds and flowers are good models if they are of such a nature as to be divided by cutting.

Sections of objects like cups, jars, vases, bottles, and keys are good models. These can be studied by handling and measuring, sufficient to make a section drawing like the box in Fig. 13.

Size of the section drawing. Make the drawings large — three or four inches long for a pencil drawing and twenty to thirty inches long on the blackboard.

A very interesting source of section drawing is representing the home of birds and animals, from original research, museum models and description. Here is a description of a chipmunk's home. From it, A, Fig. 15 could readily be drawn.

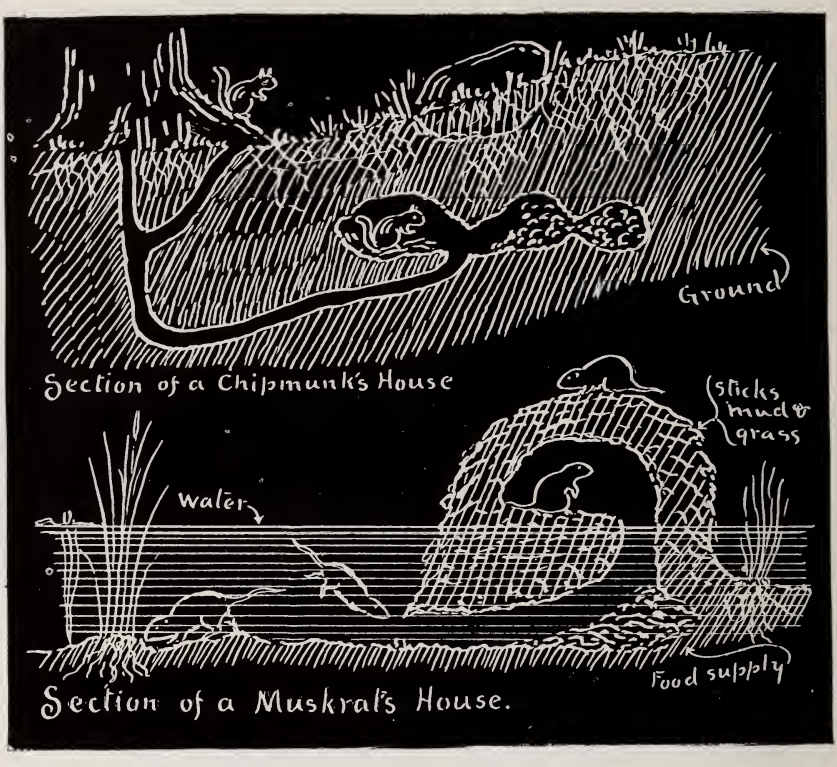


Fig. 15

The chipmunk's home is in the ground. The burrow runs down nearly straight for about a yard and then slants upward to little galleries or store houses. The nest is in one of these galleries. It is made of dried leaves. Here the little chipmunks are born. In the other galleries are stored quantities of food, more than can possibly be eaten. The chipmunk is a regular little miser in gathering and saving food. There is usually more than one entrance to the burrow. These entrances are usually under the root of a tree, stump or rock, partially concealed.

Such a drawing with the description would make an excellent chalk talk.

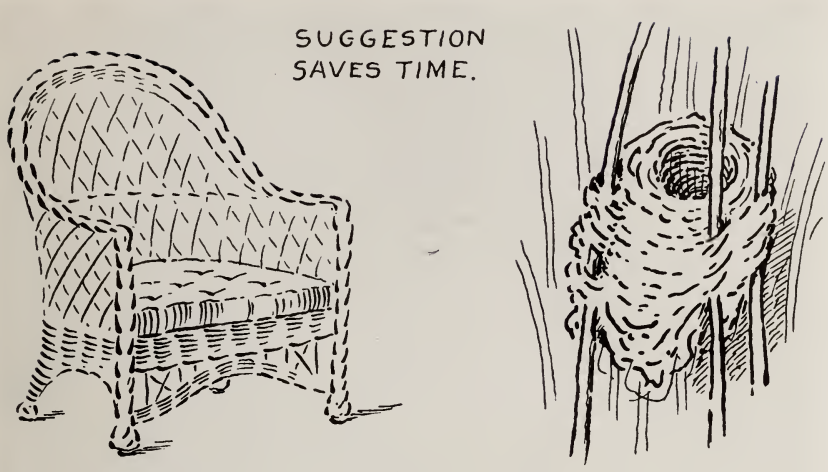


Fig. 16

Suggestion is a big word in drawing. It is the time saver of the draughtsman. In drawing we cannot represent everything we see, we must discriminate between the few essentials and the many non-essentials. There are hundreds of little details that must be rejected, there are dozens of accessories that need only be suggested and there is usually only one idea that must be represented.

In Fig. 16, there is a wicker chair and a bobolink's nest. Look at them closely and you will see that no detail of either the chair or the nest is represented, but merely suggested. The form is true, the directions are true, the proportions are true and the position of each part is true, but the rendering of each detail is merely suggestive. It is not drawn just as it would appear on the object, but its presence is suggested to the mind by a line.

Suggestion has a very wide range; it extends from the representation of the most simple objects, like an apple or ball, through more complicated forms, like glass and water, to visible forces, like light and vapor, and invisible forces, like air, to that which can be represented only by means of a symbol; as, for example, learning, wisdom, peace and similar qualities.

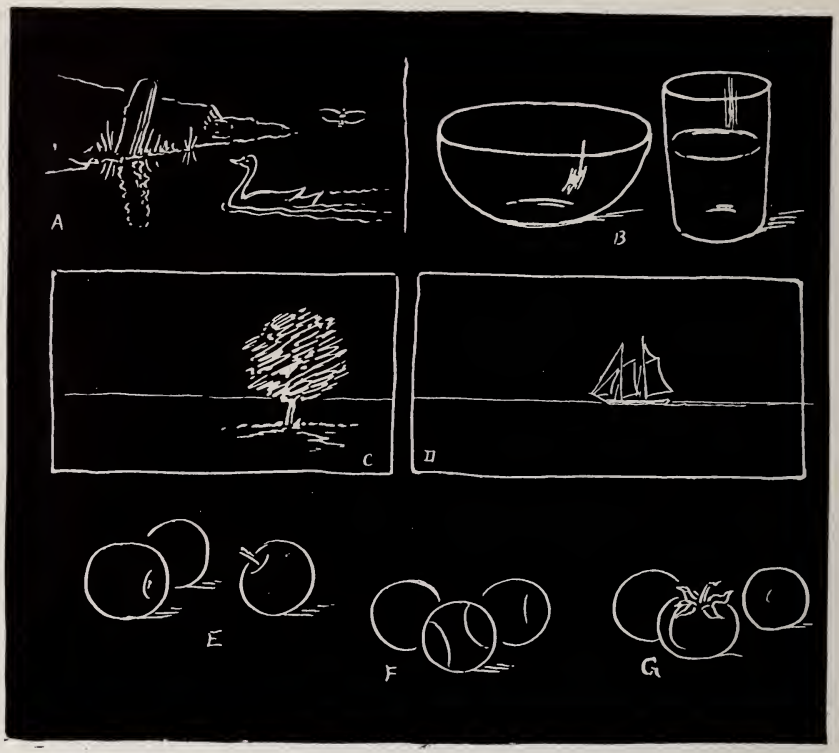


Fig. 17

In Fig. 17, there are three groups of round objects all similar in shape, but by the suggestion of a line or two, one group becomes apples, one balls and the other tomatoes. In A, the water is suggested by a reflection and the swan swimming, and the land by grass and the post. In B, the transparency of the glass is suggested by showing the farther or unseen edge and the high light through the nearer surface. C and D are alike, but the tree in the one suggests a landscape and the vessel in the other, a marine.

Invisible forces are suggested by their effect on visible objects, as air on the foliage of trees. The spiritual forces are represented by types and symbols.

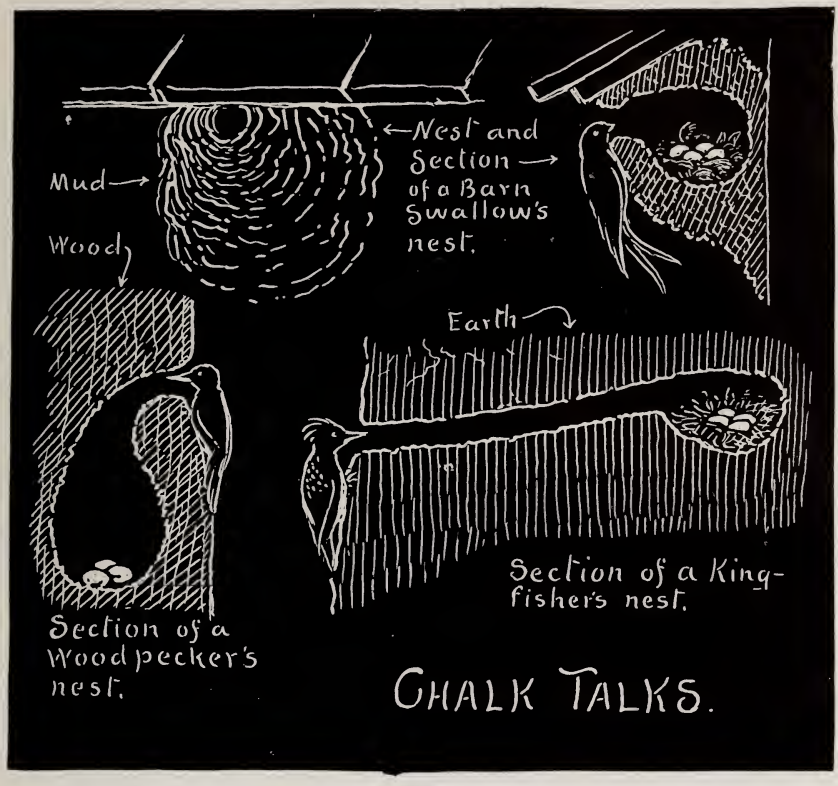


Fig. 18

Chalk Talks. A chalk talk is reproducing on the blackboard a drawing that has been memorized. The talk may or may not be accompanied by verbal language.

Chalk talks are valuable for the clearness of the thought required in preparing them; for the permanence of the knowledge acquired; for the skill gained by the hands working rapidly toward a definite end, and because they are interesting. After they have been successfully tried, a morning exercise or a Friday afternoon entertainment will hardly seem complete without several.

The method of preparing a chalk talk is to draw the picture representing the idea over and over until it is memorized, until it can be reproduced from memory quickly, easily and with a fair degree of accuracy. The first drawing in the memorizing process should be drawn carefully and much thought given to it, and then each succeeding drawing may be made more rapidly.

A chalk talk, without oral language, should not require more than two minutes in its delivery and one minute should be the average time. Groups of from two to five students may give their chalk talk at the same time.

Fig. 18 represents drawings for three chalk talks. Look up in the natural histories about each bird and its nest, arranging each fact in a short crisp sentence and when you draw a part make a remark about it. Something like this:

The woodpecker builds his nest on the inside of a large limb or trunk of a tree. It is usually a partly decayed tree that is not too hard to peck out with the bill. The nest is called its burrow. The nest is simply an enlargement of the burrow and is quite roomy. The eggs are pure white and from three to five in number.

In Fig. 15 are two excellent chalk talks.

Lists of Objects Suitable for Drawing

Seeds and Seed Pods, such as the maple, boxelder, linden, poppy, milkweed and sweet pea. Hold them in one hand and draw them with the other.

Grasses and similar growth, both green and dried, such as the clover, timothy, sorrel, flax, oat, wheat, alfalfa and many weeds. Represent the stem with one line and the joints by means of a space.

Buds. Have not more than one, two or three buds on a stem. Until considerable power is gained, it is best to pinch off the foreshortened buds. The pussy willow, the various catkins, the lilac, poplar and chestnut are excellent examples.

Leaves. Those with smooth edges, such as the lilac, ivy and clover, should be used at first. Avoid leaves with a complicated edge or outline. Draw the single leaves in many positions. Draw a stem with one, two or three leaves on it.

Flowers. Wild flowers and more simple varieties of cultivated ones, such as the sweet pea, buttercup, violet, pansy, dandelion and any kind that has few parts and a simple arrangement. Avoid confusion by cutting away the complicated parts.

Vegetables. The cucumber, squash, pumpkin, carrot, radish, pepper, onion, turnip, peas and beans. Cut away the tops of such as the onion, turnip and carrot two or three inches from the vegetable.

Nuts. Butternuts, hickory, walnuts, almonds, hazel, acorns, beechnuts and peanuts are all good. A cluster of two or three hanging from the stem is very interesting. Cut or saw a nut in two crossways or lengthways and make a drawing of the section.

Fruit. An apple, pear, lemon, peach or orange hanging from a stem with one or two leaves; two or three cherries in a bunch, a cluster of a half dozen grapes, currants and gooseberries on their stem are all good models. A tomato on its stem, a branch containing berries, and the fruit family in general make excellent models. Fruit should be picked green for this purpose. Sections of fruit such as the half or quarter of an apple are interesting.

Trees. Excellent models. Avoid details and aim for the general form. Draw the same tree a number of times. For first efforts, choose a tree with thick foliage, standing alone, with a plain background. Stand away from the tree far enough to eliminate the smaller details such as the leaves and small limbs. Use a soft pencil with a large lead and a blunt point. Groups of trees are good.

Bits of Landscape. A large rock, a group of rocks, a stump and a log, a clump of grasses or rushes, a water trough, an old pump, a gate, bars, corner of fence, an old bridge, an old building of any kind, a turn in the path or road, a point of land, rocks or logs projecting into the water. A tent, hut or bird house, chicken coop, bee-hive or cage, all will make fine models if well chosen.

Things. Small objects, such as keys, old knives, shells, fish hooks, sinkers and small padlocks. Fruit and similar baskets, stoneware in the form of jugs, jars, pitchers, vases and similar vessels, hats, caps, umbrellas and other articles of wear, mounted birds and birds' nests, feathers, and a very wide range of similar objects.

Fig. 1

SHAPE OR FORM

The Fundamental Elements of Drawing are Position, Direction, Shape, and Proportion. These elements are present in every drawing and in all branches of drawing. They permeate the whole subject and enter every phase of the work. Every object must have its position, every line its direction, every form its shape and all must be in proportion.

Position relates to place, every object and every part of the object must have its place. The eye cannot be in the place of the ear, nor the chin on top of the head.

In Fig. 1, there is a stone in the foreground. There are three rabbits placed at the left of the stone, one rabbit at the right, one farther and two nearer.

Position includes perspective. Perspective is representing objects various distances away. The trees are placed various distances away. The trees, haycocks and rabbits are placed various distances away.

Position includes composition. Composition is arranging objects in a pleasing group. The rabbits are grouped around the stone, the haycocks are grouped together in a pleasing manner, and the trees are arranged in an orderly relation.

Fig. 2

Direction. Lines show direction and it is through direction that action is represented and expression is revealed.

In Fig. 2, A, B and C are three figures represented by single lines and each representing a different action — dancing, running and catching. Observe that the head, body, arms and leg 1 of each are alike. That the difference in action is caused by changing the position and direction of leg 2 and the hands. Observe in D, E and F, and in G, H and I, how the direction of the mouth changes the expression of the face.

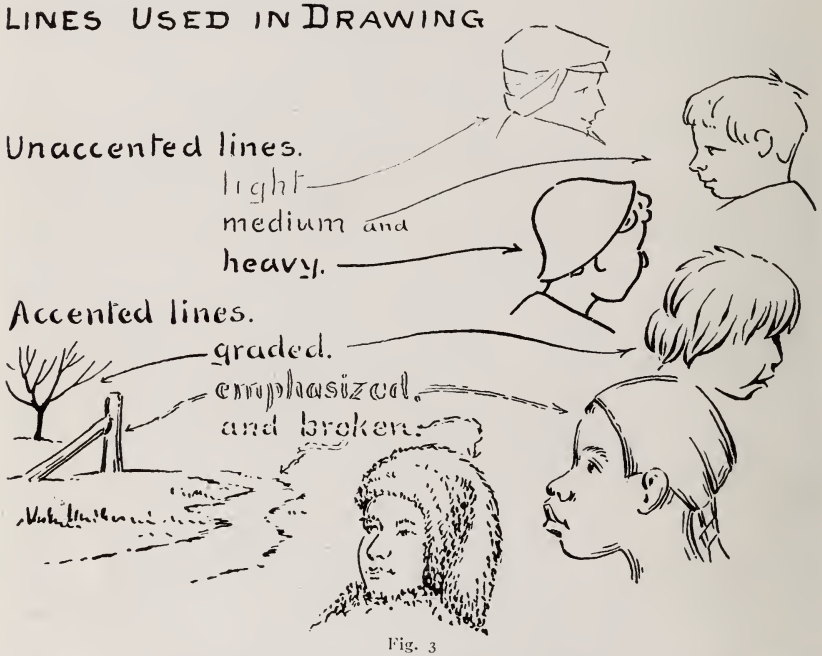


Fig. 3

Lines. The lines used in drawing may be divided into unaccented and accented lines.

The unaccented lines are light, medium and heavy. The light lines are often called sketch lines, and are used to mark in the drawing preparatory to finishing with the heavier lines. The heavy lines are more difficult to acquire than either the medium or the light lines.

The graded line is perhaps the most serviceable of all the lines and has a wider range of usefulness. It is drawn both from light to heavy and from heavy to light. This line should be thoroughly learned. See Third Year Book.

The emphasized line is several lines drawn together in such a manner as to have the effect of one line or direction.

The broken line is to represent broken surfaces. Both the emphasized and broken lines may be graded. See the Fourth Year Book.

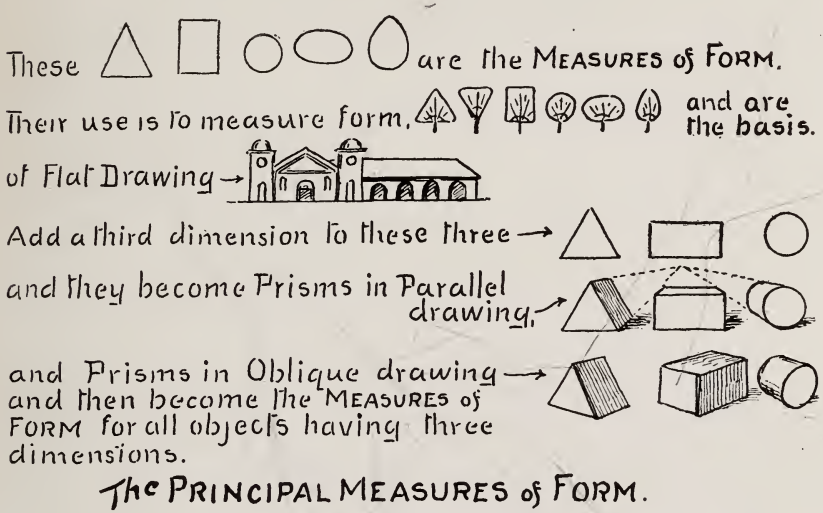
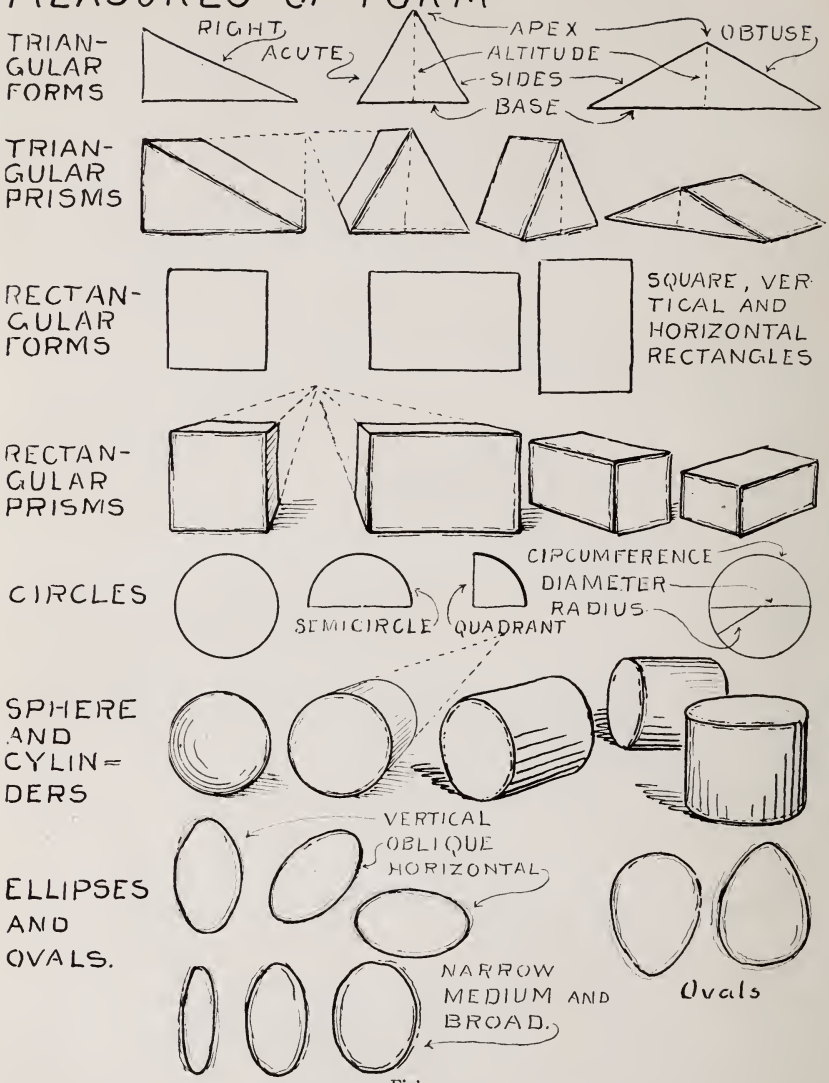


Fig. 4

Shape. The fundamental shapes that are the most useful in drawing are the triangles, rectangles, circles, ellipses and ovals. These are the measures of Form or Shape. They are used in drawing to aid in marking out the proportion, grasping the shape of more complicated objects and as a basis of the prisms and objects of three dimensions. These forms are used in design as a basis of pattern, and the construction of objects. They are also the principal measure forms in the arts and crafts and the engineering professions.


MEASURES OF FORM
TRIAN-
GULAR
FORMS
RIGHT
ACUTE
APEX
ALTITUDE
SIDES
BASE
OBTUSE
TRIAN-
GULAR
PRISMS
RECTAN-
GULAR
FORMS
SQUARE, VER-
TICAL AND
HORIZONTAL
RECTANGLES
RECTAN-
GULAR
PRISMS
CIRCLES
CIRCUMFERENCE
DIAMETER
RADIUS
SEMICIRCLE
QUADRANT
SPHERE
AND
CYLIN=
DERS
ELLIPSES
AND
OVALS.
VERTICAL
OBLIQUE
HORIZONTAL
NARROW
MEDIUM AND
BROAD.
Ovals

Fig' 5

These measures of form furnish the shape elements of the three kinds of drawing — flat drawing, parallel drawing and oblique drawing.

Flat Drawing is representing objects as they appear directly in front of the eye, in which two dimensions — length and height — are shown. This drawing is taught in the First, Second and Third Year Books.

Parallel Drawing is flat drawing with the third dimension or distance-away-element added. The front faces of the objects are parallel with the picture plane and the receding lines converge to the center of vision. Parallel drawing is taught in the Fourth and Fifth Year Books.

Oblique Drawing is taught in the Sixth Year Book. In this drawing no face is parallel with the picture plane. The lines are either vertical, or recede away horizontally at an angle with the picture plane. The following are the leading facts about the measures of form.

Triangles. The principal triangles are the right triangle, the acute triangle, and the obtuse triangle, and the principal parts are the base, altitude, apex and sides. These triangles form the right triangular prisms, the acute triangular prisms and the obtuse triangular prisms.

Rectangles. The principal rectangles are the square rectangle, the vertical rectangle, and the horizontal rectangle. Right angle and diagonal are the principal words. The square rectangle gives shape to the cube and square prism, the vertical and horizontal rectangles to the rectangular prisms.

Circles. The circle gives shape to the cylinder and sphere and the principal words are the semi-circle, the quadrant, the diameter, the radius and the circumference.

Ellipses and Ovals. The ellipse and oval are used principally in design. The chief words are longer axis and shorter axis.

With the exception of the circle the measures of form may be modified:

In width (proportion), to narrow, medium and broad widths.

In direction, to vertical, horizontal and oblique directions.

Study Fig. 5 It contains the basis of all form.

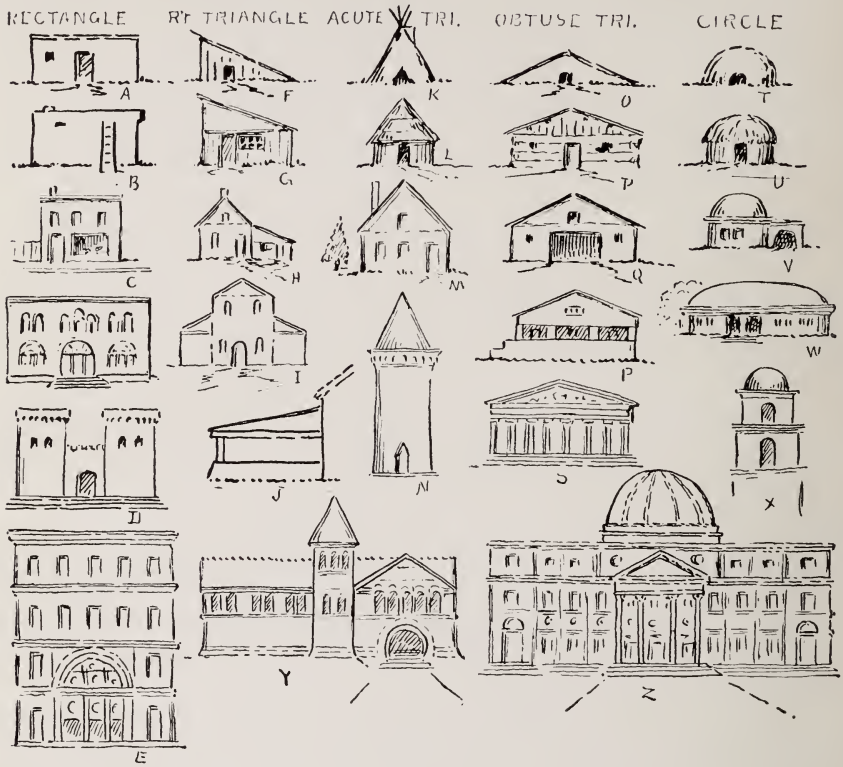


Fig. 6

Drill Exercises

1. Draw the five principal measures of form.
2. Draw a right, an acute and an obtuse triangle.
3. Draw a square, a vertical rectangle and a horizontal rectangle.
4. Draw a narrow, medium and broad vertical rectangle.
5. Draw an acute triangle and on it mark by means of its printed name, the base, the altitude, the apex, and sides.
6. Draw a circle and mark by means of its printed name, the circumference, diameter, and radius.

7. Draw a narrow, medium and broad horizontal ellipse.
8. Draw a narrow, medium and broad oval.
9. Make a flat drawing of a common box.
10. Make an oblique drawing of a square prism in a left receding direction.
11. Draw a vertical and a horizontal cylinder.
12. Draw a receding cylinder.
13. Draw a right receding cylinder.
14. Draw a left receding cylinder.

Use of the Measures of Form. They give shape to the triangular and rectangular prisms and to the cylinder and sphere.

They give a basis to both constructive and decorative design. There are no other forms that can be universally used. They are necessary in all kinds of work, giving a common measure in the arts and crafts, the sciences and the professions. When learned they aid in grasping the form and proportion elements of all other objects, however complicated they may be, not only to reproduce as in drawing, but in the common walks of life. Fig. 6 shows in a simple way how these forms enter into the art of building. In the first vertical row the rectangle is the predominating form. In the second, third, fourth and fifth rows the triangle and circle enter into the houses, each originating a distinct type, and all uniting more or less as the art becomes more complicated.

But these forms do not enter into the building trades more than into the manufacturing arts, the domestic arts and into the everyday lives of all people.

Drill Exercises

1. Draw a round, an elliptical, and an oval apple.
2. Draw a pumpkin like a vertical ellipse and a horizontal ellipse.
3. Draw a house shaped like a right triangle.
4. Draw a house shaped like an acute triangle.
5. Draw a house shaped like an obtuse triangle.
6. Draw a house shaped like a semi-circle.
7. Combine a rectangle and a right triangle in a house.
8. Combine an acute triangle and a rectangle in a house.

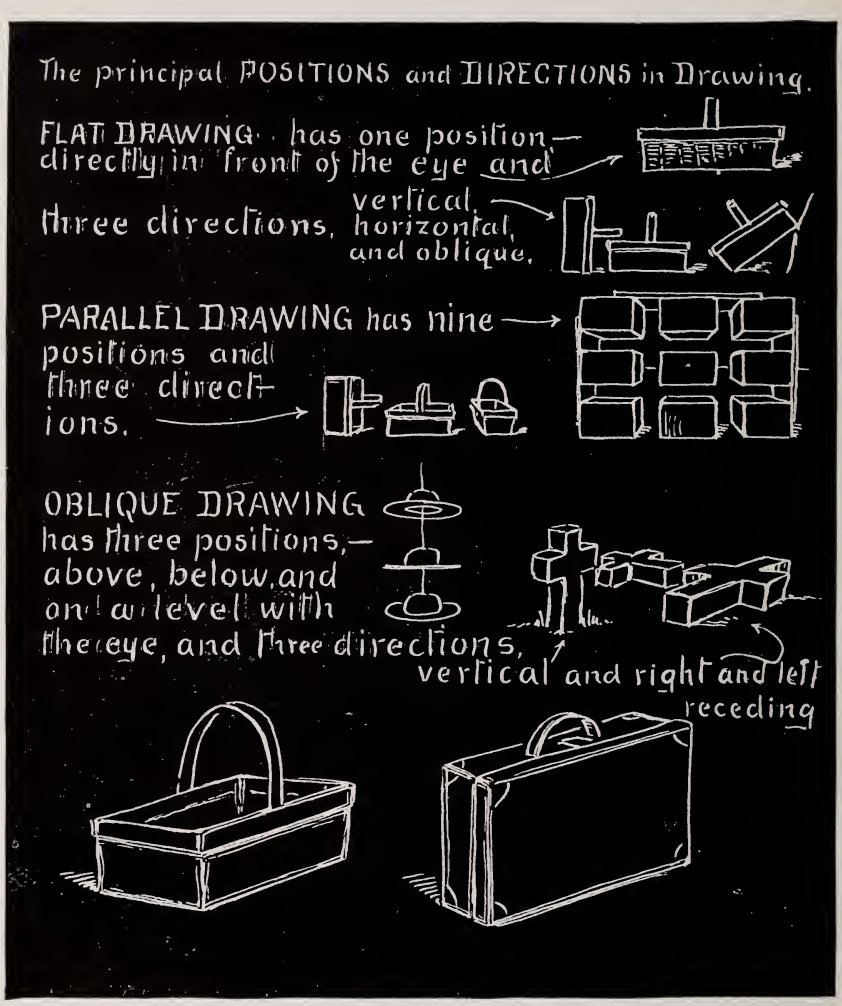

The principal POSITIONS and DIRECTIONS in Drawing.
FLAT DRAWING has one position— directly in front of the eye and
three directions, vertical, horizontal, and oblique.
PARALLEL DRAWING has nine positions and three directions.
OBLIQUE DRAWING has three positions,— above, below, and on a level with the eye, and three directions, vertical and right and left receding

Fig. 7

Position and Direction. Each kind of drawing has its principal positions and directions, an understanding of which is a great aid in the use and mastery of form. Objects in flat drawing have only one position — directly in front of the eye — but objects in this position may be vertical, horizontal or oblique, as shown in Fig. 7.

Parallel drawing has nine positions — below and above the eye, at the right and left of the eye, below and at the left, above and at the left, below and at the right, above and at the right and directly in front of the eye. This latter position belongs to flat drawing unless perspective is shown. Parallel drawing has three directions corresponding to the three directions of its lines — vertical, horizontal, and horizontal receding, used in that drawing. The oblique direction is very little used in parallel drawing.

Oblique drawing has three principal positions — above, below, and on a level with the eye, and there are three principal directions that are helpful, corresponding to the three lines used — vertical, right receding, and left receding.

In Fig. 6 there are drawn a basket and a suit case, both in oblique drawing and right receding direction. Draw them as given in the drill exercises.

Drill Exercises

1. Draw the basket in flat drawing.
2. Draw the suit case in flat drawing.
3. Draw the basket in parallel drawing, horizontal direction, below and at the left of the eye.
4. Draw the suit case in parallel drawing, horizontal direction, below and at the right of the eye.
5. Draw the basket in oblique drawing and right receding direction, below the eye.
6. Draw the suit case in oblique drawing, and right receding direction, below the eye.
7. Draw the suit case in left receding direction.

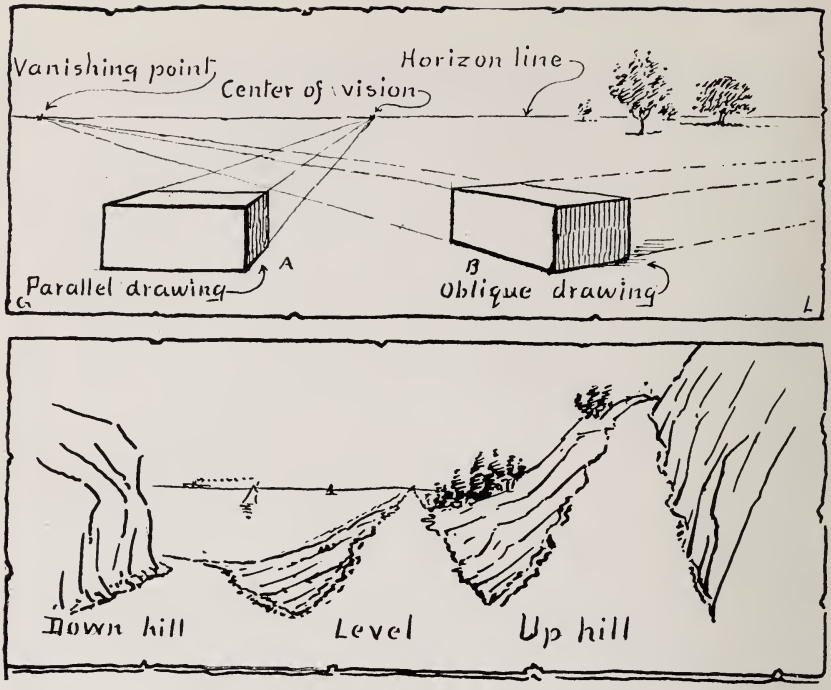


Fig. 8

Terms and definitions. The Picture plane is the flat surface on which the drawing or picture is made. It is a real plane.

The Ground plane is not a real plane, but the picture of a plane. It is at right angles to the picture plane. It is the plane or flat surface leading from the ground line GL out to the horizon line.

The horizon line is the line that marks the level of the eye and shows whether the top or bottom face of objects can be seen. This is the most important line in drawing.

The center of vision is the point in the horizon line directly opposite the eye. It is used in Parallel drawing only and is the vanishing point for all horizontal receding lines or lines at right angles with the picture plane — lines that go directly away from you. It also determines whether the right or left face of objects can be seen.

Vanishing points are points where parallel receding lines vanish or converge. There may be as many vanishing points as there are sets of receding lines. Horizontal receding lines vanish at the center of vision. Oblique horizontal receding lines vanish in the horizon line right and left of the center of vision.

Then there are oblique receding lines that converge above the horizon line, which may be called uphill lines, and those that converge below the horizon line, which may be called downhill lines.

With the exception of the center of vision in parallel drawing, vanishing points are very little used in freehand drawing.

Drill Exercises

1. Represent a right triangular prism in parallel drawing.
2. Represent a right triangular prism in oblique drawing.
3. Represent an uphill road.
4. Represent a downhill road.
5. Represent a level road.
6. Represent a plank or board balanced on a log in a horizontal receding direction.
7. Represent the same board as slanting upward (up hill).
8. Represent the same board as slanting downward (down hill).
9. Represent two acute triangular prisms in the same drawing, one in parallel, the other in oblique drawing.
10. Represent two rectangular prisms in the same drawing, one in parallel, the other in oblique drawing.

It is the Principle we are after, it is the principle we must get.

The Principle is the essence of understanding, the center of knowledge. It is the big part. If we do not get the Principle, we practically get nothing. We get little that is worth while.

It is the Principle that sees, grasps, understands and assimilates, and then applies the facts to widely varying conditions. Get the Principle.

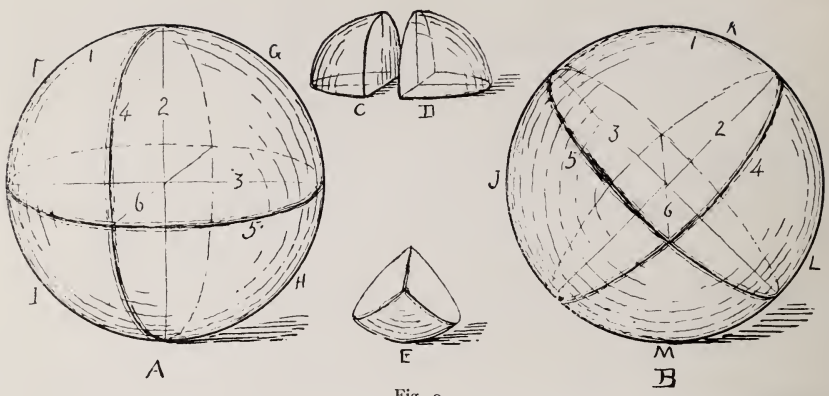


Fig. 9

The Sphere may be considered as an application of the cylinder. The two drawings, A and B, dividing the sphere into eight parts, will meet about every condition in the drawing of the whole or a part of the sphere. Draw each sphere in the order of the numbers beginning at the circumference 1. Draw the circumference 1; then the two lines passing through the center marked 2 and 3; then the ellipses 4 and 5, and lastly the receding line 6.

Drill Exercises

1. Draw A and remove the quarter marked G.
2. Draw A and remove the quarter marked F.
3. Draw A and remove the half marked F and G.
4. Draw the upper half of the sphere A.
5. Draw the quarter marked F.
6. Draw the quarter marked G.
7. Draw B and remove the quarter marked K.
8. Draw B and remove the quarter marked L.
9. Draw the quarter marked M.
10. Draw B and remove the half marked K and J.

The spirit of knowledge can hardly be applied by rule, but by the study of the letter (the rule) we may absorb the spirit, which is universal in its application.

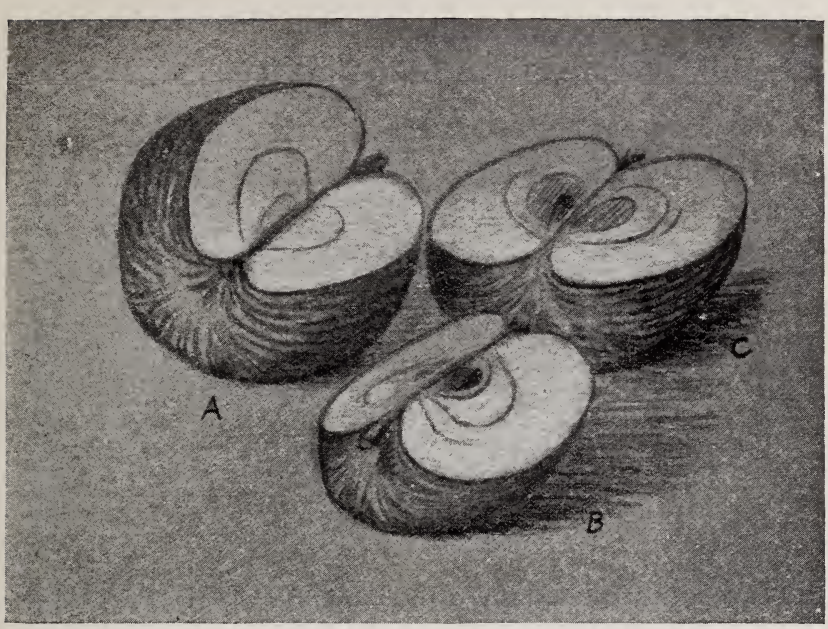


Fig. 10

We study the sphere in certain set positions easy to understand, trusting that the principle will be absorbed to the degree that the learner can use it universally, to cover all positions all conditions, from a tiny pebble to the great round world.

Follow up the drill exercise on the sphere by drawing from an object in which the same principle can be employed. Perhaps there is no better object than an apple. Procure an apple and cut from it a quarter as shown in A, Fig. 10. Place it in an L shape background and draw it carefully, applying the principle learned in Fig. 9.

It is always well to draw the object several times. It is better to draw the same object a number of times than to change to different objects. It is better to learn one thoroughly than several partially.

Draw the apple with the quarter removed, recedingly, horizontally, and vertically. Draw the quarter in the same manner, and then the half.

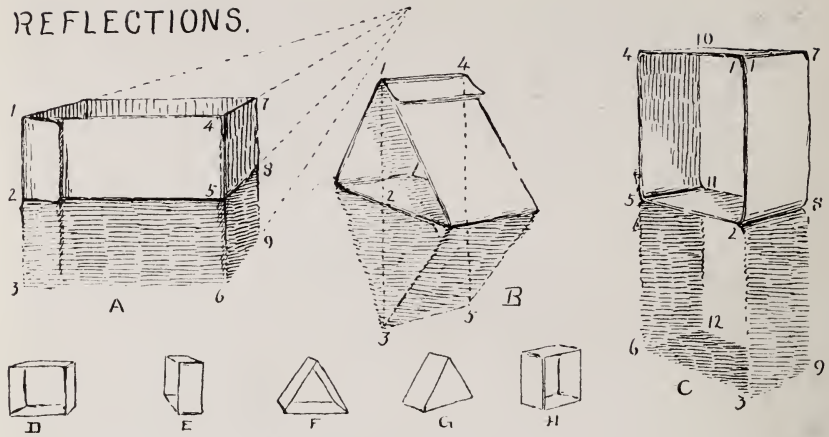


Fig. 11

Reflections. Use for a reflecting surface a piece of bright tin or similar material, about eight inches long and six inches wide. Do not use a mirror, as the mirror reflects from the under surface of the glass and leaves a space between the object and its reflection. Place the tin on the desk or table before you, about two feet away, and about the length of a lead pencil below the eye. The reflecting surface should rest horizontally.

Procure for models a small box, a small triangular prism and a cylinder. All of these models may be made from strips of drawing paper one inch wide and six inches long, and bent in the form of a box, a triangular prism and a cylinder, and the meeting ends glued or pinned. Leaving the ends open does not detract from their excellence as models.

Place the box-shaped model on the reflecting surface of the tin as in A, Fig. 11, and observe:

That the reflection is like the box, except inverted. That the reflection is the same size as the box. That the length of the reflected edges 2–3, 5–6 and 8–9 are the same length as the real edges of the box. That the reflected edge 6–9 vanishes at the same point as the real edge 4–7.

Observe in B that the reflected point 3 is in the same vertical line with the real point 1, and that point 3 is as far below point 2 as point 1 is above. That reflected point 5 is in the same vertical line as point 4. In C, point 12 is as far below point 11 as point 10 is above.

From the above the following law may be deduced: In perfect reflection each point is reflected in a vertical line and as far below the reflecting surface as the point is above.

Drill Exercises

1. Place a box on the reflecting surface in the position of A and draw it. A is below and at the left of the eye.
2. Place a box on the reflecting surface in the position of D and draw it.
3. Place a box on the reflecting surface in the position of E and draw it.
4. Place a box on the reflecting surface in the position of C and draw it. C is in oblique drawing and right receding direction.
5. Place a box on the reflecting surface in the position of H and draw it.
6. Place a triangular prism on the reflecting surface in the position of B and draw it. B is in oblique drawing and right receding direction.
7. Place a triangular prism on the reflecting surface in the position of F and draw it.
8. Place a triangular prism on the reflecting surface in the position of G and draw it.

Language, Number and **Drawing** are the fundamental studies through which we formally acquire and express thought. They are largely mechanical in construction, and furnish the mechanical basis of all other studies. That is, all other studies are combinations of language, number and drawing. Language communicates through sound, as in talking, and by means of letters as in writing; number measures, gives weight, value and dimension; and drawing shows form, color, and appearance.

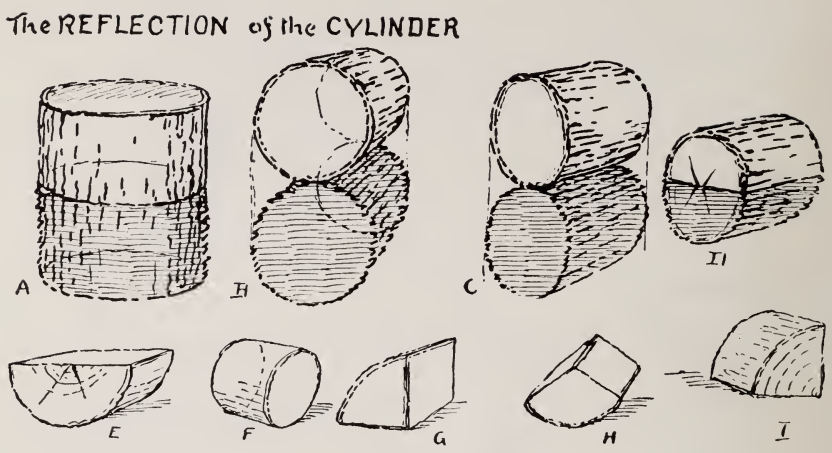


Fig. 12

Reflection of the Cylinder. The work in reflections may be used as a review of flat, parallel and oblique drawing.

Use for models a small round box, a strip of paper rolled in the form of a cylinder, or better still, cylinders about an inch and a half in diameter, and one to two inches long, sawed from the limb of a tree. Split several models into halves and quarters as shown in Fig. 12. Leave the models in their rough state.

Place a vertical cylinder on the reflecting surface and observe that they are like two real cylinders placed one on the other; that the top face of the real cylinder can be seen, but in the reflection it cannot be seen; that the reflection obeys the same law in regard to the drawing of the unseen ends as if it was a real cylinder.

Place a cylinder on the reflecting surface in the position of B, and observe that the reflection of each point is in a vertical line with the points reflected and as far below the surface as the point is above. B is a receding cylinder, hence the receding lines of both cylinder and its reflection recede to the center of vision.

Drill Exercises

1. Place a vertical cylinder on the reflecting surface as in A and draw it.
2. Place a cylinder on the reflecting surface in the position of C and draw it.
3. Place a cylinder on the reflecting surface in the position of B and draw it.
4. Place a cylinder on the reflecting surface in the position of F and draw it.
5. Place a half cylinder on the reflecting surface in the position of D and draw it.
6. Place a half cylinder on the reflecting surface in the position of E and draw it.
7. Place a quarter cylinder on the reflecting surface in the position of G and draw it.
8. Place a quarter cylinder on the reflecting surface in the position of I and draw it.
9. Place a quarter cylinder on the reflecting surface in the position of H and draw it.

Water is the great reflector. Perfectly still water is a mirror. Water in motion distorts the reflection. Vapor reflects light, but not images. Water reflects that which is above it. Perfectly clear water is the color of that which it reflects. Sidewalks and pavements on a rainy day reflect and are the color of that which is above them. Water reflects light and color. It reflects the blue sky, the bright sunset, the rainbow, the green foliage of the trees and the myriads of light, color and form effects that are all about us.

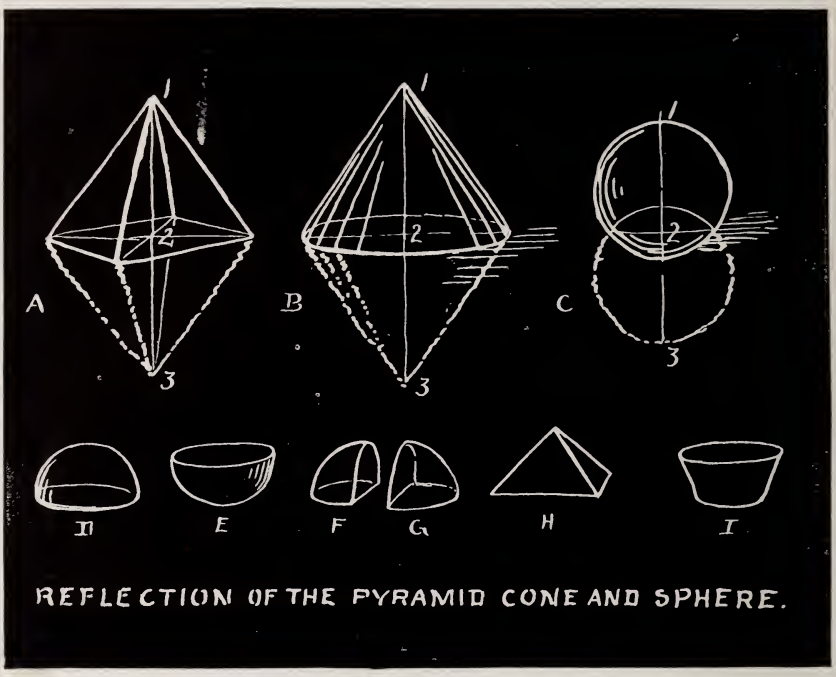


Fig. 13

The Reflection of the Pyramid, Cone and Sphere. In the reflection of these three models the center of the base is necessary to find the height of the reflection. The point 3 in each is as far below point 2 as the point 1 is above it. It is the distance below point 2 that gives the depth of the reflection. The models may be small blocks, the pyramid and cone may be made from paper or cut from a potato, a piece of soap or plaster of Paris. The sphere and its parts may be a marble or an apple.

1. Place a pyramid on the reflecting surface and draw it.
2. Place a cone on the reflecting surface and draw it.
3. Place a sphere on the reflecting surface and draw it.
4. Place hemisphere D on the reflecting surface and draw it.
5. Place hemisphere E on the reflecting surface and draw it.
6. Place the quarter of a sphere F on the reflecting surface and draw it.
7. Place the quarter of a sphere G on the reflecting surface and draw it.

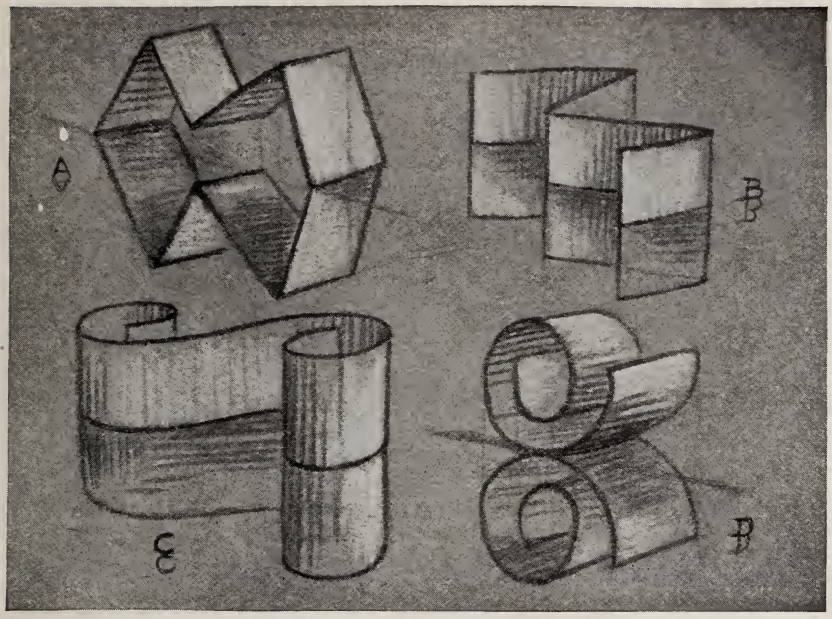


Fig. 14

Any small object such as an acorn, eraser, a cork, bits of rock, little islands made of sand with twigs for trees, a miniature bluff and like objects may be placed on the reflecting surface and drawn. There are no objects better for drill purposes than strips of paper six inches long and one inch wide, bent or rolled as shown in Fig. 14, and then placed on the reflecting surface and drawn. Each of these models may be drawn in the vertical, horizontal, receding and oblique directions. Models B and C are vertical and models A and D are oblique.

Drill Exercises

1. Bend a strip of paper M shape and place it on the reflecting surface and draw it in the position of A.
2. Draw the M shape model in the position of B.
3. Reverse the M shape model making it like a W.
4. Roll a strip of paper round the lead pencil, making a model similar to D, and draw it.
5. Roll a model similar to C and draw it.

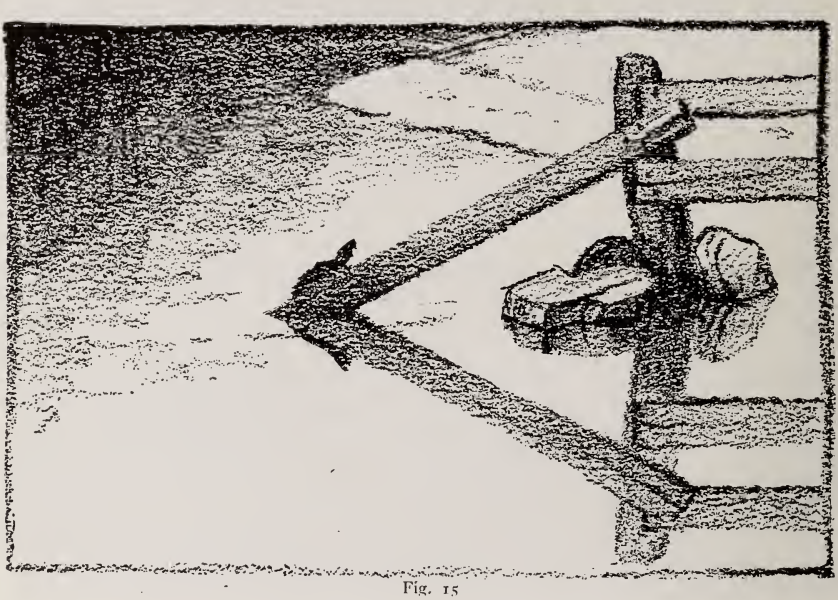


Fig. 15

All surfaces reflect light more or less, but only polished surfaces reflect images. In nature water is the great reflector of images. This is perhaps the greatest characteristic of water. Perfectly still water is a mirror, and reflects images from its surface as accurately as a glass mirror. Reflections are as varied as the conditions under which they are seen.

After drawing the drill exercises and skill has been acquired in using the principle, study reflections along the bank of a lake, stream or pond. A fence projecting into the water, a rock on the shore, a log or stub projecting from the surface, a bridge, the end of a pier, a boat house, a boat at anchor, a buoy, and similar objects are all excellent objects for this purpose.

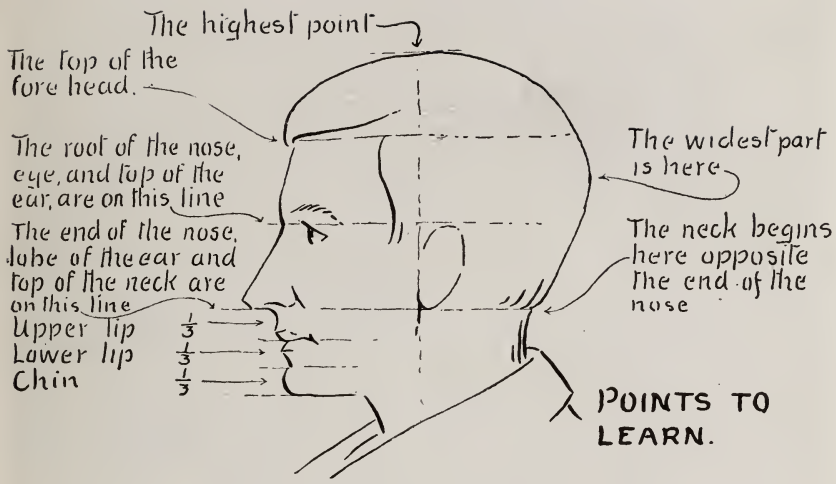


Fig. 1

DIRECTION

The Human Head. There is perhaps more real desire to represent the human head and face than any other object. It is undoubtedly the most interesting object in the world.

The drawing of the human head may be divided into two parts:

First — The Position, Form and Proportion elements and

Second — The Direction elements.

These elements include both action and expression.

The position, form and proportion elements are taught as follows: Choose a model, perhaps several of them may be necessary, as often a point is plainer on one than on another. Boys are preferable on account of the shortness of the hair showing the shape of the head more plainly.

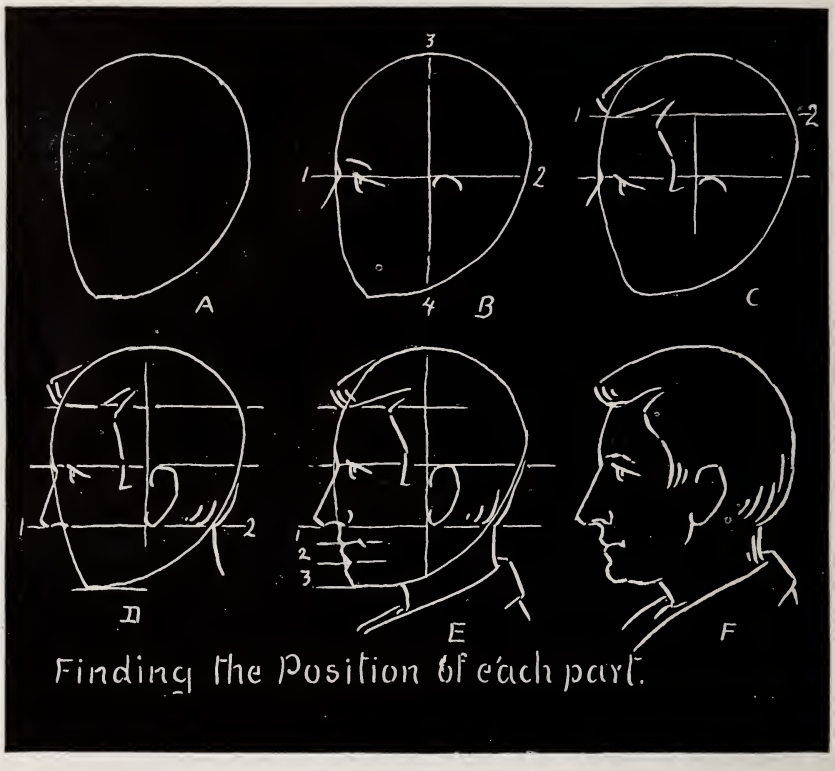


Fig. 2

Learning the Position of Each Part of the Head. Stand the model before the class side view and lead the students to see each point both on the model and in the drawing. A general standard must be established to fix the position of each point. Ask the students to look at the head carefully and note its general shape. They will see that the general shape is oval, similar to A, Fig. 2. Draw this oval form on the blackboard about two feet in length similar to A. B, C, D, E, and F are the same outline, each representing an additional step.

Draw a light horizontal line midway between the top and bottom

of the oval, as 1, 2, in B, and lead the students to see that this line marks the root of the nose, the eye and the top of the ear. Lead them to see this on the model.

Draw a vertical line down through the center of the oval, as 3, 4, and lead the students to see that the ear is back of this line. Is this true on all heads? No. It is a general rule that is an aid to the mind in judging these positions. When learned it becomes a standard to aid the judgment when drawing from the real head. Mark these points on the drawing as in B.

Draw a line half way between the top of the head and the top of the ear as in C. This line will mark approximately the top of the forehead or the parting of the hair. Lead the students to see this on the model and mark it on the drawing, as 1, 2, in C.

Draw a light line half way between the root of the nose and the chin, as 1, 2, in D, and lead the students to see that this line marks approximately the end of the nose, the lower point of the ear and the top of the neck. These are three very important points. Mark them in the drawing on the blackboard, as in D, and lead the students to see them on the model.

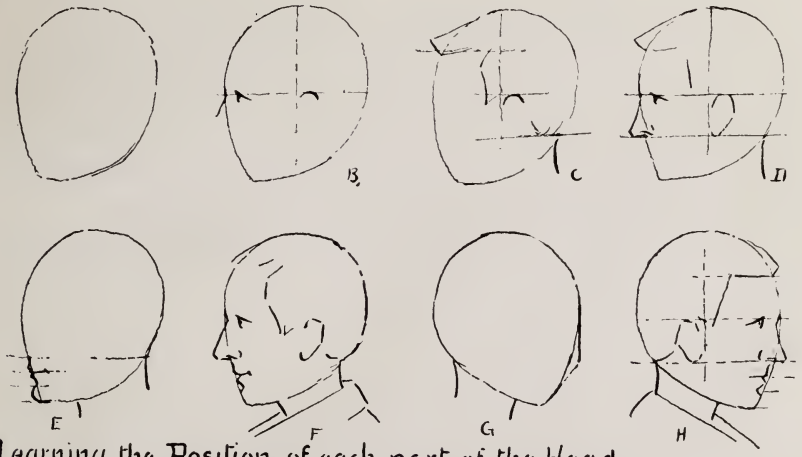


Fig. 3

Divide the lower quarter, or that part between the end of the nose and the chin, into three equal parts as 1, 2, and 3, in E. These will approximately mark the upper lip, the lower lip and the chin. Lead the students to see this on the model and represent it in the drawing, as in E. The front line of the neck is placed by the judgment alone.

This gives the position of each part. The next step is through a drill exercise to learn to place each part according to the above plan.

Drill Exercises

1. Draw the oval A and place the ear. Figs. 2 and 3.
2. Draw the oval A and place the nose and eye.
3. Draw the oval A and place the hair.
4. Draw the oval A and place the nose, ear and neck.
5. Draw the oval A and place the upper and lower lips, mouth and chin.
6. Draw the oval A and place each part of the head.
7. Draw the oval G and place the nose, eye, ear and neck. Fig. 3.
8. Draw the oval G and place the hair, ear and neck.
9. Draw the oval G and in the following order mark the ear, nose, eye, hair, mouth and chin.

Learning to Draw Each Part of the Head. The next step is to learn how to draw each part. This is learned largely through the copy. A good way is to learn how to draw a typical nose, a typical ear, eye, mouth, and chin; also how to represent hair, and then apply these until learned. In Fig. 4, this has been done and such types have been chosen as can be made plain with the least difficulty.

Observe in the nose A, that the wing 3 is nearer the line of the upper lip 2 than the end of the nose 1, and that the eye is immediately back of the wing 3.

Observe in B that the ear is about twice as long as wide — that it is contained in two squares.

Observe in C that the vertical length of the upper lip, lower lip and chin are about equal. Observe that the upper lip projects forward more than the lower lip. Observe that the lower lip at 2 is about half the distance from the mouth to the chin.

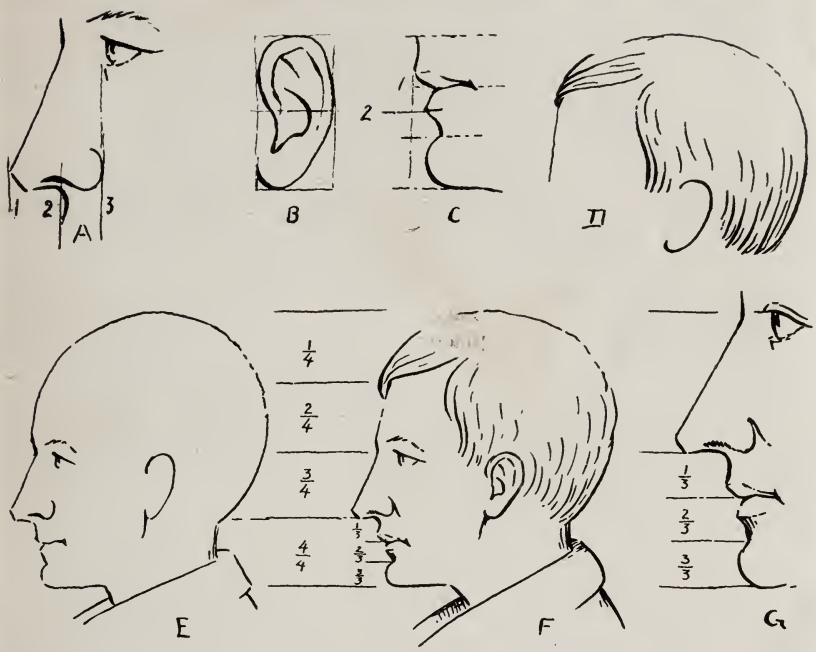


Fig. 4

Drill Exercises

1. Draw the nose A several times to learn how and then draw it from memory on the blackboard.
2. Draw the ear B until you can reproduce it from memory on the blackboard.
3. Draw the lips, mouth and chin until they can be reproduced on the blackboard as in C.
4. Draw the hair D.
5. Draw the face G until it can be reproduced from memory. Face G is the union of the nose A and the lips and chin C.
6. Draw head E until it can be drawn from memory.
7. Draw head F until it can be drawn from memory.

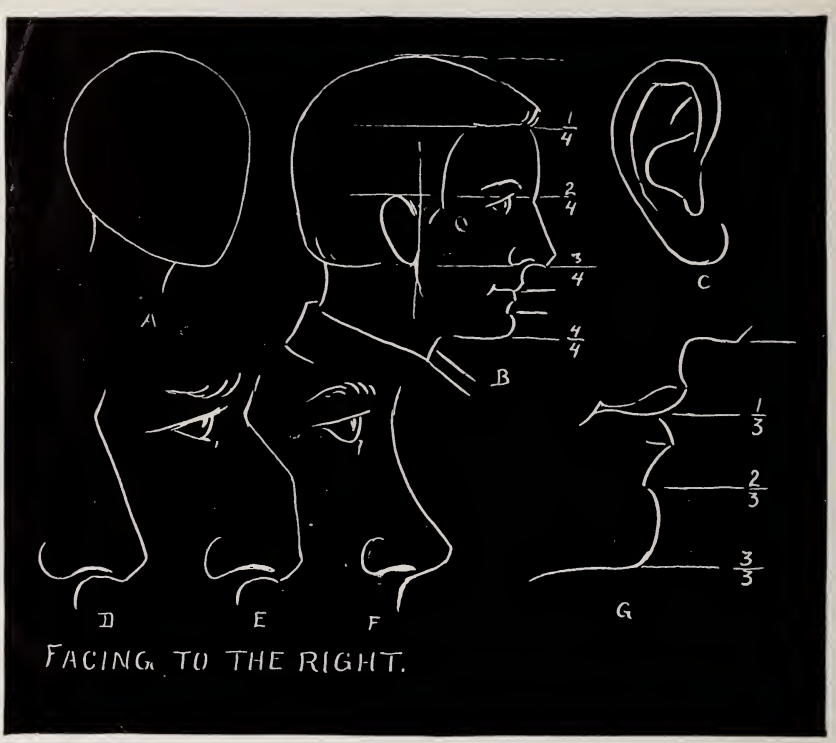


Fig. 5

After the head is learned with the face to the left, it requires some practice to learn how to draw it, facing to the right. In Fig. 5, are represented the different parts as facing to the right. The following facts should be memorized, through use, in order to establish a working standard. These facts should be memorized, not as a rule, but as a guide to aid us in reproducing the head.

The shape of the head side view is oval, similar to A.

The root of the nose, the eye and the top of the ear are on the horizontal line, half way between the top of the head and the bottom of the chin.

The parting of the hair is at the line marking the first quarter.

The end of the nose, the lower part of the ear, and the top of the neck are on the line marking the third quarter.

The ear is immediately back of the vertical line through the middle of the head.

The upper lip, lower lip and chin each occupy a third of the lower quarter or the distance between the end of the nose and the lower point of the chin.

The ear is about twice as long as wide.

Drill Exercises

1. Draw the oval A and place the neck.
2. Draw the oval A and place the ear.
3. Draw the oval A and place the eye and nose.
4. Draw the oval A and place the mouth and neck.
5. Draw the oval A and place the neck, nose, ear and hair.
6. Draw the ear C until it can be reproduced from memory.
7. Draw the mouth and chin G until it can be reproduced from memory.
8. Draw the head B until it can be drawn from memory.

Noses E and F may be substituted in place of the nose in head B.

Memory Drawing. It is more easy to commit to memory the drawing of an object, than to memorize a piece of prose, a rule in arithmetic or a tune on the piano. Why? Because it is more tangible, it has shape, it can be seen, it is less abstract. When once the habit is formed of representing objects and giving expression to our thoughts, through drawing, it will be found that our powers of memory will be as great in this line as in any other.

Fig. 6

Drawing from the Pose, or the real head, should go hand in hand with the drill work; they should be mutually helpful. The drawings show how, give the method, and what to look for in the real head. They show how to look for the general form, find the position of each part and how to represent the real head in picture form.

Students may take turns posing. Older people are preferable as models, as they are more patient and the characteristics are stronger.

The general method given in Object Drawing is the one best adapted

to this work. In general draw as follows: Look at the head as a whole. Study it. Then with light lines mark in the large parts, then the smaller, and lastly finish. Look for the long lines and large parts, before marking in the smaller details. Prove the position of each part. Use more construction lines than are shown in Fig. 6.

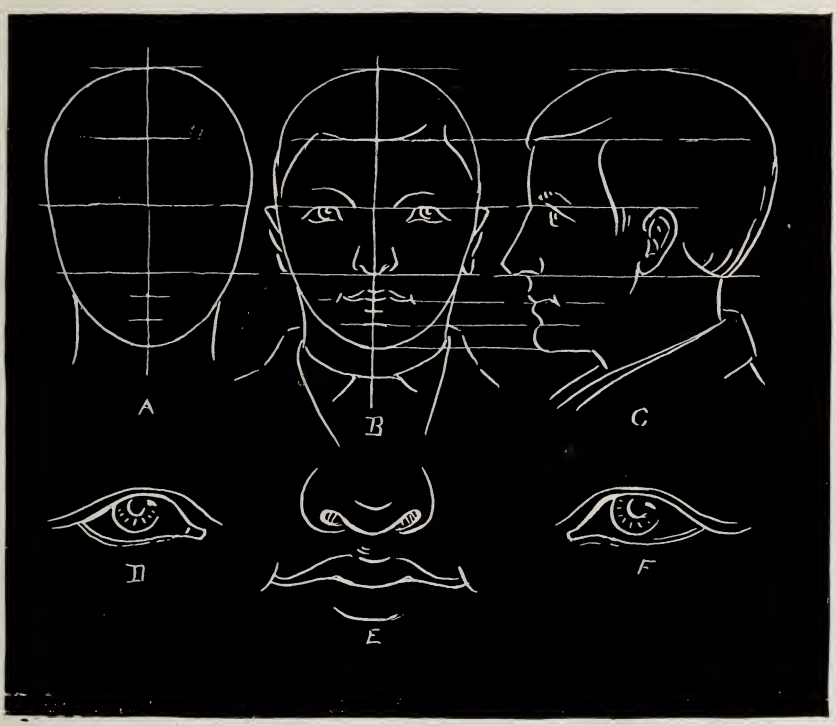


Fig. 7

The Front View of the head is a symmetrical oval, the widest part of which is immediately above the ears. It is three-fourths as wide as long.

By comparing the front view B with the side view C, it will be seen that the vertical spacing is the same.

In the front view B, the lower part of the nose may be taken as a center from which the mouth and eyes may be placed quite accurately.

Observe that the mouth is somewhat wider than the wings of the nose and that the inner angles of the eyes are slightly at the right and left of the wings.

Drill Exercises

1. Draw the oval A and place the neck, ears and hair.
2. Draw the oval A and place the nose and then the mouth.
3. Draw the oval A and place the nose and then the eyes.
4. Draw the eyes D and F.
5. Draw the nose and mouth E.
6. Draw the head B until it can be drawn on the blackboard from memory.

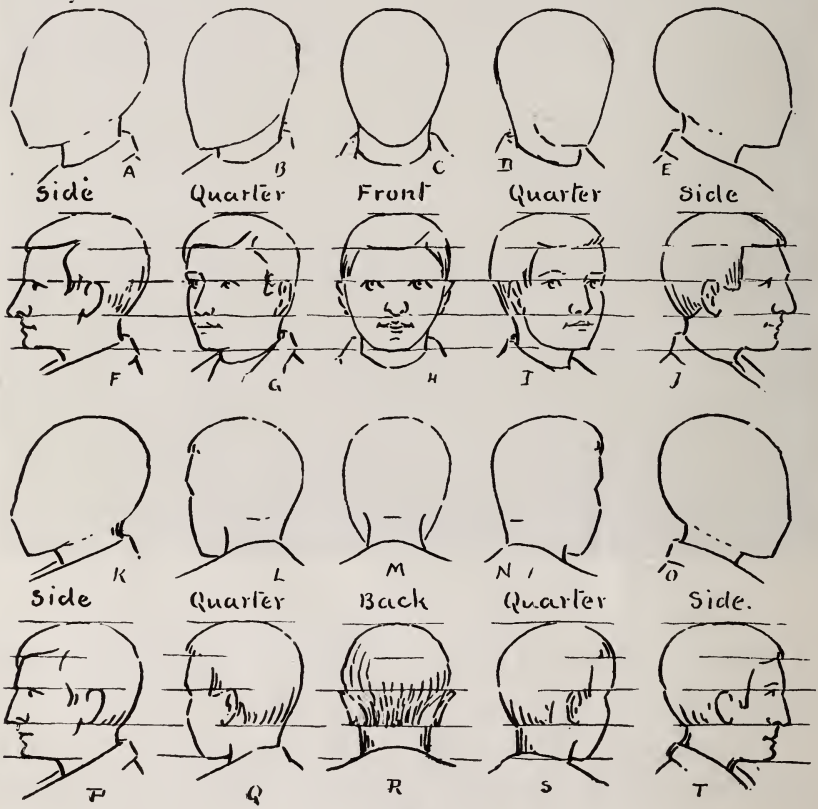


Fig. 8

The Quarter Views. For convenience, the study of the head may be divided into side, front and quarter views. The quarter views are a combination of the side and front views as may be seen in Fig. 8. Observe in the drawing: That all the views are oval. That the vertical spacing is alike in all as may be seen in the second horizontal row, also in the last. The best way to learn these quarter views is to draw them.

Drill Exercises

1. Draw quarter view B and place nose, eyes and ears.
2. Draw quarter view B and place the ear and hair.
3. Draw quarter view D and place the nose, eyes and ear.
4. Draw quarter view D and place all the parts.
5. Draw the quarter view L and N.
6. Draw quarter view L and place the ear and hair.
7. Draw quarter view N and place the ear and hair.
8. Draw quarter views B and L.
9. Draw quarter views D and N.
10. Draw back view M.

Memorizing Heads. The difficulty of memorizing the heads in Fig. 8, is not nearly so great as one would suppose from the number of the drawing. If one memorizes the side view, it helps him to memorize the front view, and both of these are an aid in the quarter views. It is not like memorizing separate objects that are unlike, but like slightly changing the same object.

Drill Exercises

1. Draw a quarter view similar to A Fig. 9 and reproduce it on the blackboard.
2. Draw a quarter view similar to C until it can be reproduced from memory on the blackboard.
3. Draw a quarter back view and reproduce it from memory.
4. Draw quarter view poses from the real head.

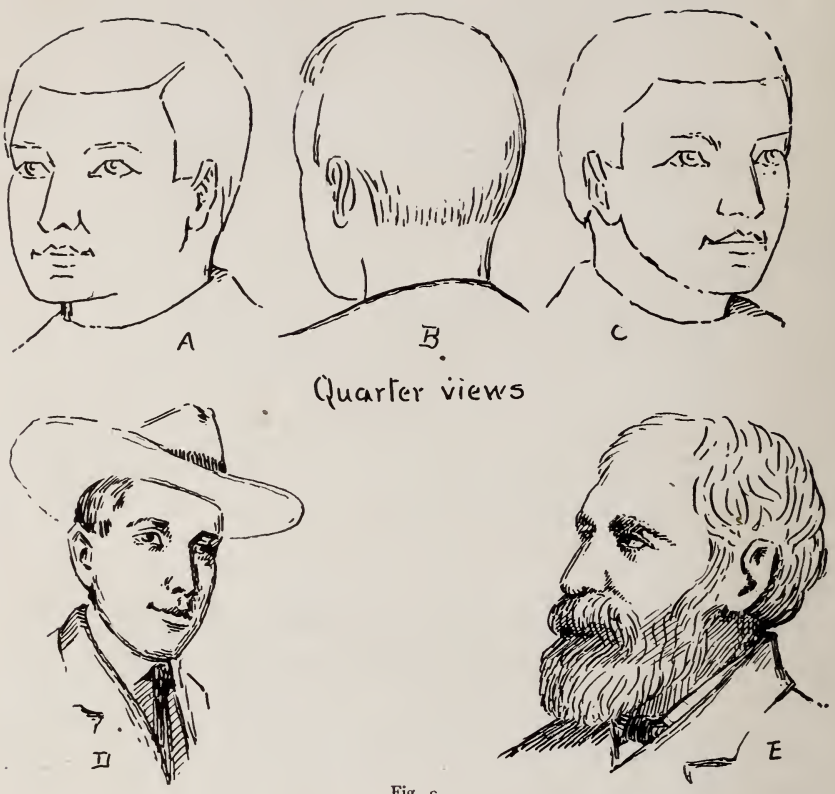


Fig. 9

The quarter views are the most common and have the widest range. Their study after learning the mechanical facts as given here, may be extended to photographs, drawings from papers and magazines and the model. It is well to cut from magazines well-executed examples, paste them on cardboard, and use them in study. Little progress can be made in any of this work before the mechanical elements are well learned. After this is done, then the higher elements can be more successfully handled.

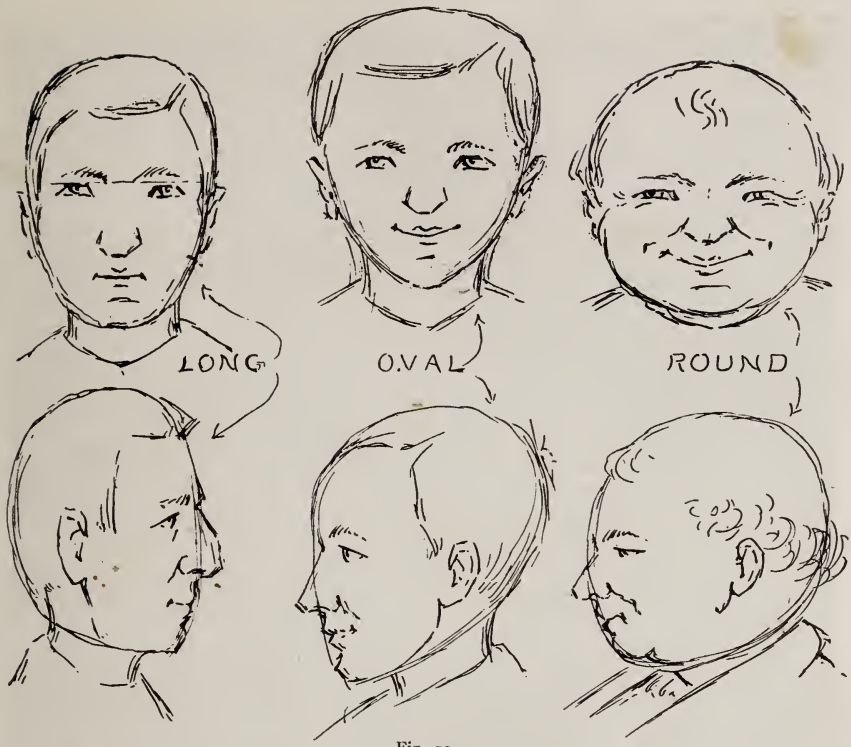


Fig. 10

Modifying the Head. There are three distinct types of head — the long, the oval and the round. In the long head, the vertical lengths predominate; that is, the head is long as compared with the width. The oval head is broad at the top, and narrows down to the chin, the neck is slender. The round head is characterized by breadth. The head is wide as compared with the length. These heads may be characterized as long, medium and broad, or long, oval and round. In shape, the long head is like a vertical ellipse, the medium head like an oval, and the broad head like a circle.

1. For to-morrow's lesson in drawing learn to represent a long head.
2. For to-morrow's lesson in drawing learn to represent a round head.
3. For to-morrow's lesson in drawing learn to represent an oval head.

Fig. 11

The Element of Direction has run through the entire system of drawing, and has included:

The direction of lines in representing surfaces. See the Second Year Book.

The direction of lines in representing growth, as seen in growing plants, trees, vines and grasses. See Third Year Book.

The direction of lines in representing movement, as seen in moving objects, caused by gravity, wind, water and motor forces. See Fourth Year Book.

The direction of lines as seen in animate form. This includes the

expression of life as seen in Birds. See the Fifth Year Book. As seen in the movements of animals. See the Sixth Year Book. As seen in the movements of the human figure. See the Seventh Year Book. The expression of the human face as given in this Eighth Year Book.

And lastly, the expression of rhythm as suggested by the graceful and harmonious relation of lines, forms, and colors. See Rhythmic Exercises in the First, Second, Third, Fourth and Fifth Year Books; Decorative Design in the Fifth, Sixth, Seventh and Eighth Year Books. Also Color in the Fourth, Fifth, Sixth, Seventh and Eighth Year Books.

Action in drawing is not a thing or form, but a motion, and as such is revealed through the direction of lines, hence it is a branch of the element Direction. It is the office of lines to show direction, hence the direction of the line not only shows the surface of objects, but reveals the action as well. The direction of the line implies movement in the same direction as the line. The trunk and limbs of a tree suggest movement from the ground upward; falling rain or snow suggests movement downward; smoke from the chimney and the direction of bunting reveal the motion of the air; the direction of the body and limbs indicates the action of running, and the smile and frown are indicated by the direction of the lines of the face.

The Expression of Lines. The expression of lines in the human face is in general as follows:

Vertical lines express strength and dignity. Horizontal lines express repose.

Oblique lines express animation and motion.

Curved lines express pleasure; they predominate in the positive expressions, such as produce the smile, laughter, and give joy and peace.

Angular lines express disorder, and are seen in pain, passion, sorrow, and predominate in the negative expressions, as seen in the scowl and in weeping.

Parallel lines express order and formality.

It is not implied that these lines express these qualities exclusively or under all conditions. Other lines and combinations of lines may express similar qualities, very much as several different words may express nearly the same thought.

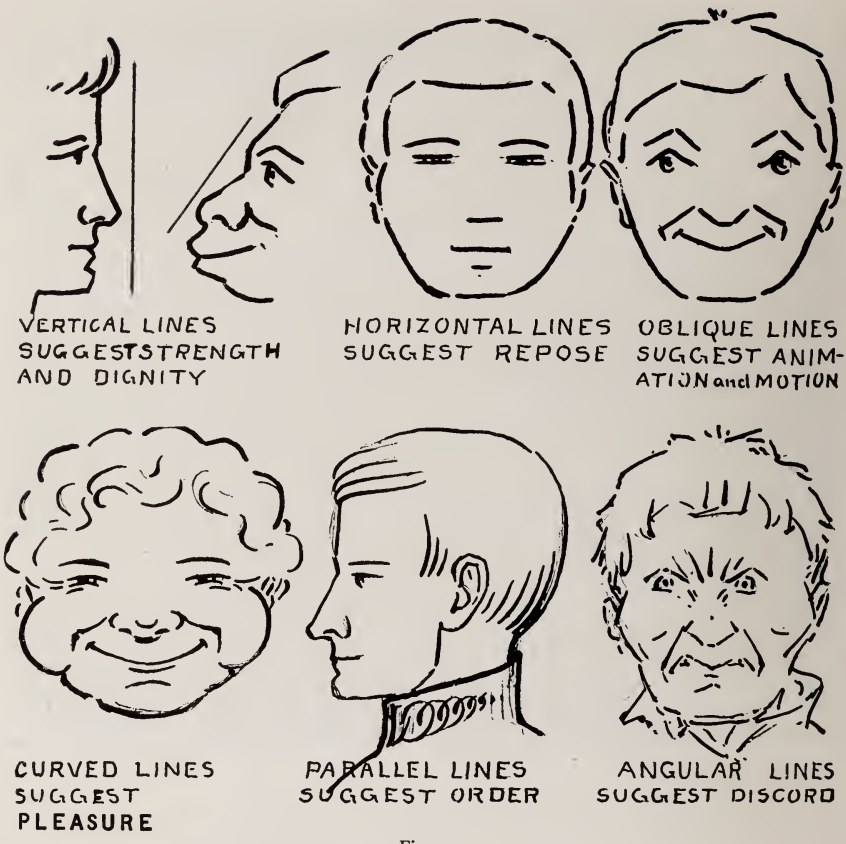


Fig. 12

Learning Action. Action is learned through the copy or drawing. It is difficult if not quite impossible to learn to express action from the living model. We can verify, perfect and study the action from the living model, but the art itself, like all arts, has been of gradual growth, handed down through the agency of past experience. But action can be learned from other drawings or pictures because the picture represents both the art and the action, both the accumulated experience of the past and the idea to be expressed.

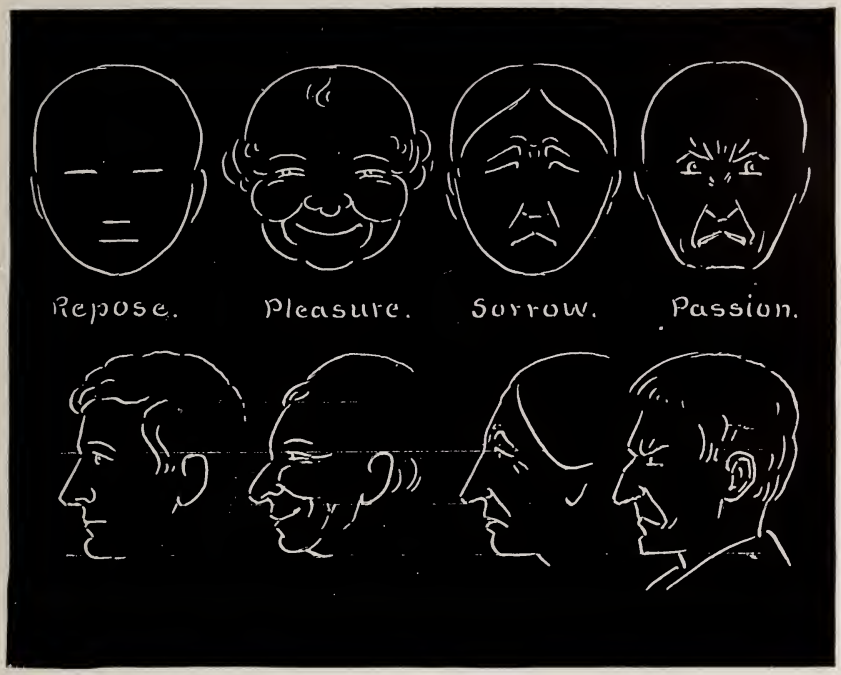


Fig. 13

Perhaps the most rapid and direct means of learning action is as follows:

First — Learn how to represent the action through the copy. That is, learn the mechanical means of expressing it. Then:

Second — Use the action. Use it by reproducing it from memory and in imaginative work, until it can be represented with some degree of facility. Then:

Third — Perfect. Study from the real model to verify, correct and perfect the action until it can be represented with both accuracy and facility.

These three steps may go hand in hand, each doing its part in gaining the power to express action.

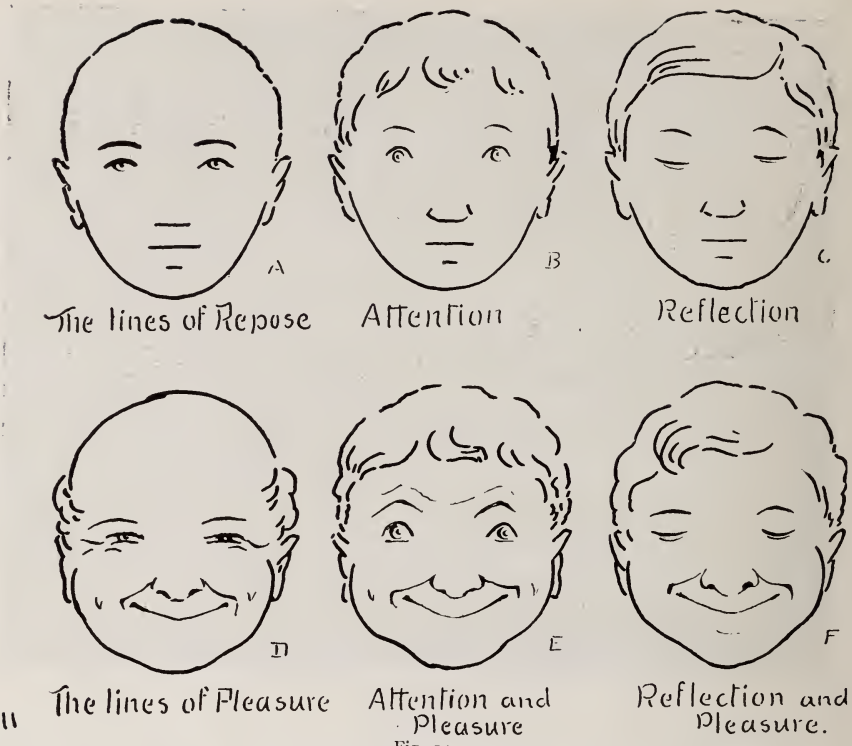


Fig. 14

Human Expression may be divided into two broad divisions — the Positive Expressions and the Negative Expressions, and these in turn merge into one another, forming the wide range of expressions in the human face.

The Positive expressions are those that represent the higher and more pleasing qualities such as would be represented by repose at one extreme, and pleasure as represented by the smile and laughter at the other.

The negative expressions are included in the lower and more displeasing qualities with the expression of sorrow at one end and extreme passion, such as fear, anger, and hate at the other.

Between these four extremes, repose and pleasure on one side, and sorrow and passion on the other, it is not difficult to construct a method of representing expression that is within the reach of the average student who has followed the work to this point.

Broadly speaking, the horizontal line is the line of repose; that is, the eyes, nose and mouth are natural. The curved line of grace expresses pleasure. Sorrow and pleasure are opposite qualities and the lines that express each are opposite in this respect. Pleasure expands outward and upward, and sorrow contracts and droops downward, with more or less of the angular. Passion is discord and is expressed by the lines of discord — the angular lines.

Expression is more mechanical than is commonly thought, and these mechanics may be learned so that the various expressions can be expressed more or less successfully, but before doing so one must have learned to draw the head with some degree of facility.

The Mechanics of Expression. The lines of repose are horizontal as shown in A, Fig. 14. The mouth expression in A, B and C is the same. Raise the eyelids and eyebrows, as in B, and it gives the expression of attention, interest or surprise; depress the eyelids, as in C, and the expression of reflection is obtained.

D shows the lines of pleasure. The mouth expression in D, E and F is practically the same, but in E the expression of the eyes is that of attention and in F that of reflection. It will be seen that the eye expressions of B and C are combined with the mouth expressions of D to form E and F. The whole process is largely mechanical.

Drill Exercises

1. Represent in a face the lines of repose.
2. Add to the face of repose, attention.
3. Add to the face of repose, reflection.
4. Represent in a face the lines of pleasure.
5. Combine the expression of attention and pleasure.
6. Combine the expression of reflection and pleasure.

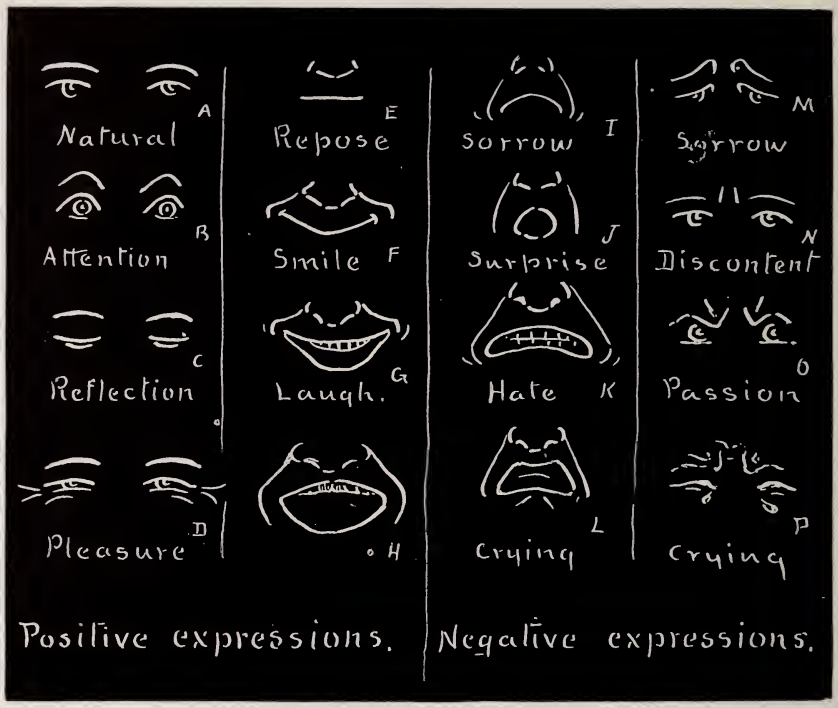


Fig. 15

Representing Expression. The following is a simple and direct way of representing expression. It is largely mechanical, thus bringing it within the reach of all. In Fig. 15 there are represented the extreme expressions of the eyes and mouth. They are also such as can be represented most easily.

A represents the eyes in their natural expression as they would appear when not excited by other than ordinary thought and feeling. This expression is used in expressing repose, in calmness, peace, the quiet smile, singing, and calling.

B represents the eyes opened wider by lifting the upper eyelid and eyebrow, thus showing more of the pupil. This gives the expression of attention and interest, and when open wider still, surprise.

C represents the eyelids drooping, the eyebrows remaining natural. This expresses reflection, thoughtfulness, as when the mind is directed within and away from outside influence.

D gives the expression of pleasure. The eyebrows are natural and the eyelids more or less closed with curved wrinkles at the outer angles. Merriment, amusement, delight, joy are some of the expressions.

E represents the mouth in repose. The eyes are natural. The normal lines of the face are horizontal.

F, G and H. The smile and the laugh elevate the wings of the nose and the corners of the mouth. The outward curve is the predominating line and expansion the leading word. In degree, the expression is from a quiet smile to the heartiest laughter.

I, J, K and L. In the mouth expressions, sorrow causes the outward corners of the mouth to drop, and pleasure to elevate, as in F and I. J is a passive expression; the lower jaw merely drops, as in the expression of surprise and wonder. K is intense hate or rage and closes the teeth tight. It is the opposite of pleasure which tends to open the mouth. L, crying, relaxes the muscles and is the opposite of laughter.

M expresses sorrow. The inner angle of both eyebrow and upper eyelid is elevated and this causes the eyebrow and eyelid to droop. The downward slant is the leading line. Grief, anxiety, distress, pain, fear, and sadness are modifications of the expression.

N, O and P. Discontent wrinkles the space between the eyebrows. In degree it extends from a slight displeasure through the frown to the most intense passion as shown in hate and anger. This expression goes more or less with rage, pain, horror, fear, moroseness, aversion, loathing, greed and gloom. Contraction is perhaps the leading word, and angular lines the predominating lines.

An excellent plan to learn expressions is to combine them as shown in Figs. 16 and 17. In Fig. 16, the mouths are alike, giving little more than a passive expression, yet by the expression of the eyes shouting A, yawning B, singing C, laughing D, horror E, fright F are obtained.

In Fig. 17, the eyes express passion and are practically alike in all, but the mouth is that of repose A, pleasure B, laughter C, surprise D, hate F, rage G and horror H.

By combining these expressions, as given in the drill exercises we will soon learn to represent the stronger and less subtle expressions.

The side views can readily be taken from the front view as shown in E and I, Fig. 17. E is the same as F and I the same as H.

Fig. 16

1. Combine in a face expressions A and E, Fig. 15.
2. Combine in a face expressions A and F.
3. Combine in a face expressions B and E.
4. Combine in a face expressions B and F.

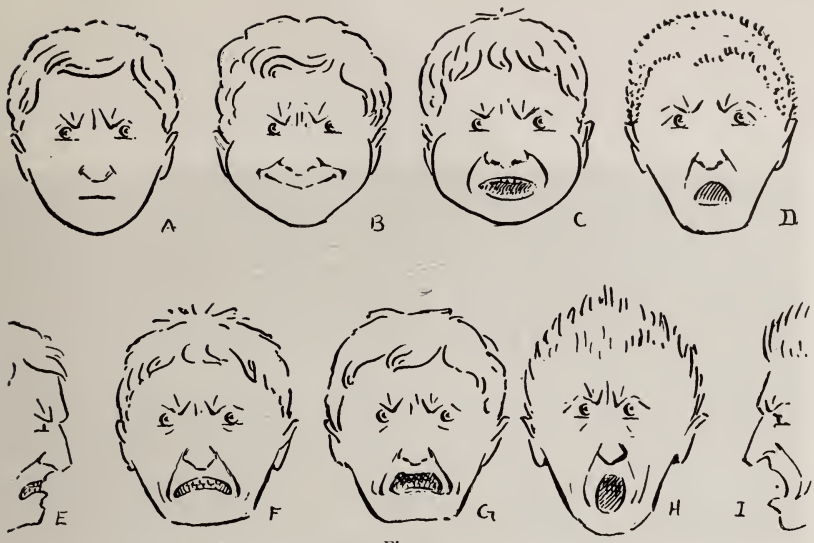


Fig. 17

5. Combine in a face expressions B and J.
6. Combine in a face expressions C and E.
7. Combine in a face expressions C and F.
8. Combine in a face expressions C and G.
9. Combine in a face expressions C and J.
10. Combine in a face expressions D and E.
11. Combine in a face expressions D and F.
12. Combine in a face expressions D and G.
13. Combine in a face expressions D and H.
14. Combine in a face expressions D and J.
15. Combine in a face expressions D and L.
16. Combine in a face expressions M and E.
17. Combine in a face expressions M and F.
18. Combine in a face expressions M and J.
19. Combine in a face expressions M and K.
20. Combine in a face expressions M and L.
21. Combine in a face expressions N and E.
22. Combine in a face expressions N and J.
23. Combine in a face expressions N and F.
24. Combine in a face expressions O and E.
25. Combine in a face expressions O and F.

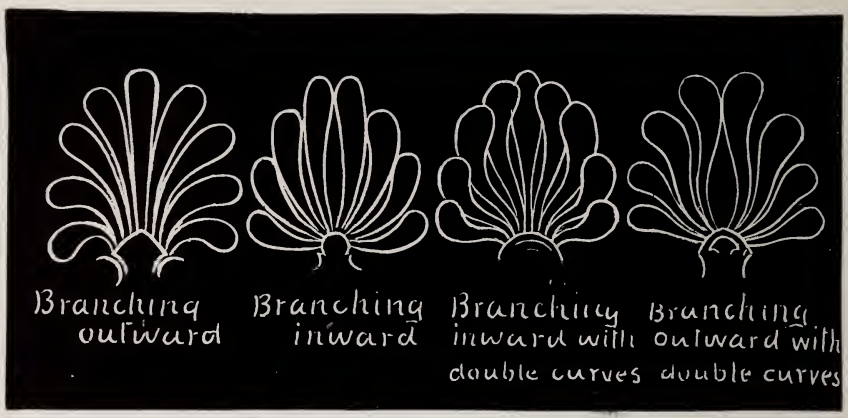


Fig. 1

DECORATIVE DESIGN

The straight lines, the single and double curves, with their inward and outward branching, the geometrical forms, and the standard units, give a complete set of tools with which to work in decorative design. They unite in themselves practically all of the elements that the designer can use. They represent decorative words to express decorative thought, and figures of design to work problems of ornamentation. These tools are the servants of the mind and as such the greatest freedom may be exercised in their use; they may be added to or subtracted from, multiplied, divided, or modified in any way the mind may devise. There are no more elements to be given, the list is complete. All that now remains is to make these tools our own until they become willing and obedient instruments in our hands. They have infinite use, and can be applied to all decoration.

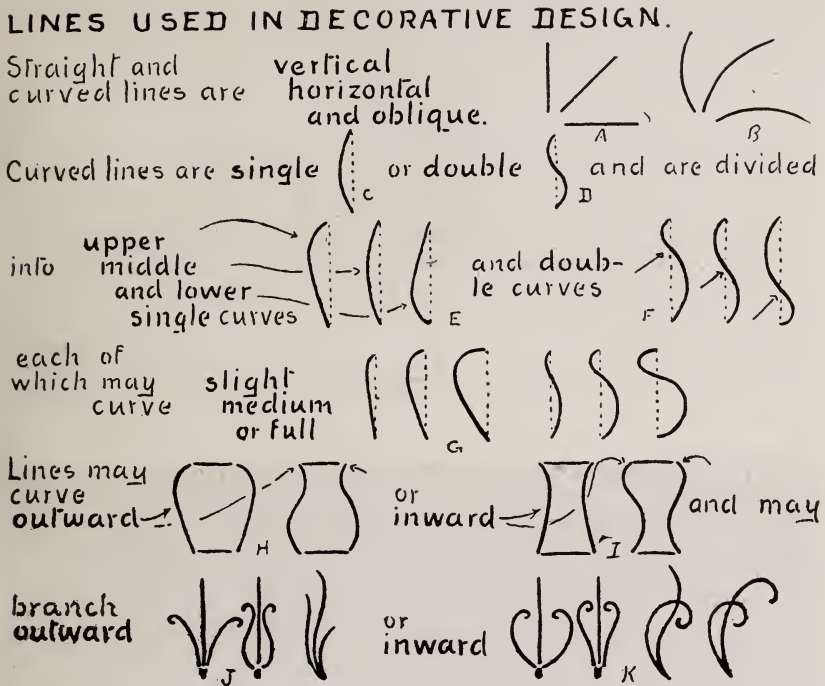


Fig. 2

Lines. The chief use of lines in decorative design is to show direction and to modify form. The directions are vertical, horizontal and oblique, and are indicated by both straight and curved lines. A curved line can take these general directions as readily as the straight lines.

Curved lines both single and double are divided into upper, middle and lower curves — E and F, Fig. 2. This is a valuable division, as it enables one to designate a curved line with considerable accuracy. An upper, middle or lower single curve is one in which the greatest degree of curvature is above, at the middle, or below the middle of the line. And an upper, middle and lower double curve is one in which the reverse is above, at the middle, or below the middle of the line. The arrows indicate these points in Fig. 2.

All curves may curve slight, medium or full, as in G, thus recognizing the three degrees into which qualities are generally divided.

Lines may curve outward or inward. This is readily seen and understood in regard to the single curves, but as the double curves curve both ways, an arbitrary distinction must be given in order to show the difference between outward and inward double curves. This is done by letting the top of the line determine whether it is outward or inward. So when the top of the double curve curves outward it is called an outward double curve, and when inward, an inward double curve, as indicated in H and I, Fig. 2. By this means it is in harmony with the branching of these lines.

Single and double curves may branch outward or inward, with both single and double curves. J and K.

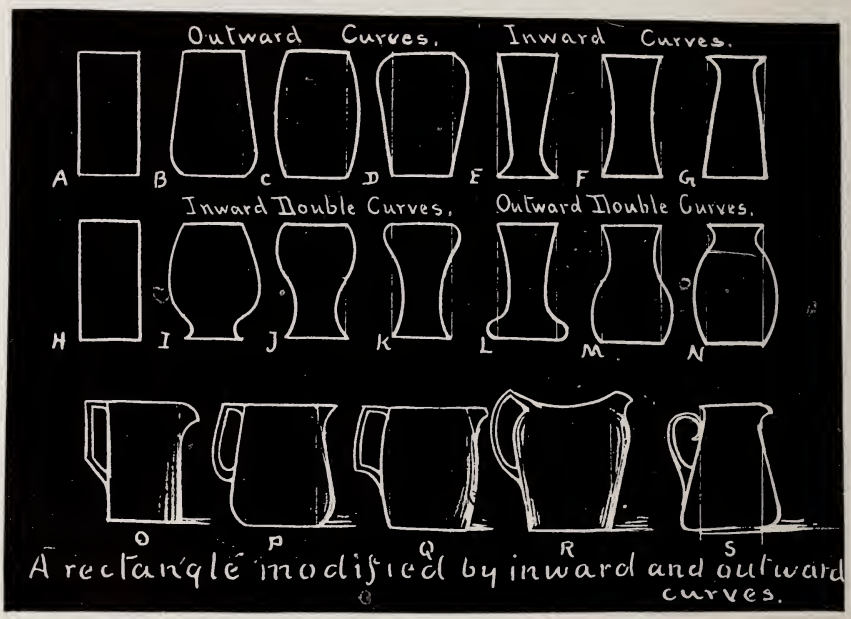


Fig. 3

To know these lines thoroughly, and to know how to use them readily, gives the student a wonderful power in modifying form and in representing direction. These lines are taught in the Fifth Year Book.

Fig. 3 shows the use of the curved lines in modifying form. A is a vertical rectangle. In B, there has been substituted lower outward curves in place of the vertical lines of A. In C, middle outward curves have been substituted, in D upper outward curves, in E lower inward curves, in F middle inward curves and in G upper inward curves.

H is a vertical rectangle. In I, J and K the inward double curves have been substituted in place of the vertical lines of H, and in L, M and N, the outward double curves. In the last horizontal row there are some applications in the form of pitchers.

Drill Exercises

1. Modify rectangle A with lower outward curves. With lower inward curves.
2. Modify rectangle A with upper outward curves. With upper inward curves.
3. Modify rectangle A with outward middle curves. With inward middle curves.
4. Modify rectangle H with lower double inward curves. With lower double outward curves.
5. Modify rectangle H with upper double outward curves. With upper double inward curves.
6. Modify rectangle H with middle double inward curves. With middle, double outward curves.

Power. An understanding of the lines in Fig. 2 gives power. Power to design, say, one hundred pitchers, one after the other, no two alike, and to do it as readily as working one hundred problems in addition.

Some one has said that originality is a thorough knowledge of fundamental elements. These lines are fundamental, and when learned give a power in design, unknown to one who does not understand them.

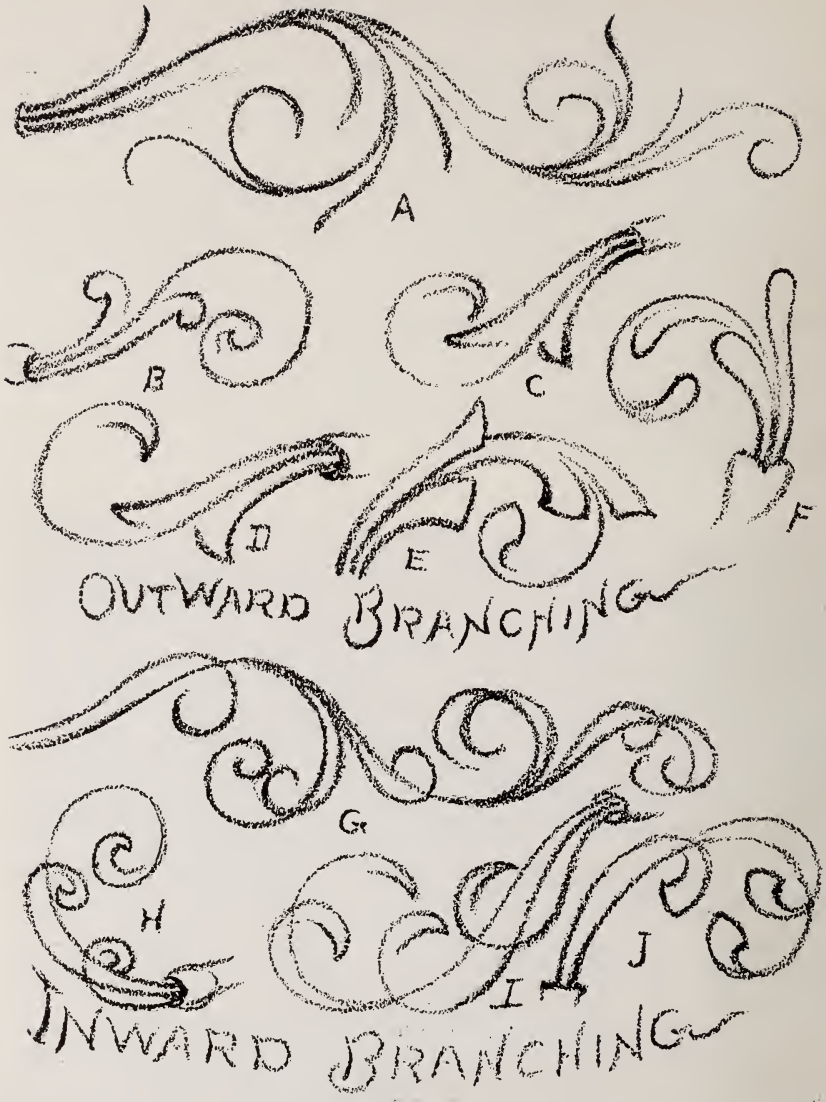


Fig. 4

The Branching of Lines is one of the greater elements in decoration. It is the basis of an infinite number of combinations running through the entire subject of decorative design. To draw these curves and branches with facility, requires much practice and persistent effort, but so important is it that these elements be acquired, that almost any amount of application and hard work is justifiable in their acquisition. The designer must acquire the ability to draw these curves and branches with ease, freedom and skill.

A, Fig. 4, is a good example of outward branching and G of inward branching. A, B, C, D and F represent outward branching with standard unit endings, and H, I and J are examples of inward branching. The branching of lines is taught in the Sixth Year Book.

Drill Exercises

1. Make an outward curved drawing similar to A.
2. Make an outward curved drawing similar to B.
3. Make an outward curved drawing similar to C.
4. Make an outward curved drawing similar to D.
5. Make an outward curved drawing similar to E.
6. Make an outward curved drawing similar to F.
7. Make an inward curved drawing similar to G.
8. Make an inward curved drawing similar to H.
9. Make an inward curved drawing similar to I.
10. Make an inward curved drawing similar to J.

Fig. 1 represents the loop in outward and inward branching, both with single and double curves. In like manner all of the standard units may be used. Fig. 1 represents the Greek Anthemion.

The Ionic Capital is the whorl in outward branching, and the Corinthian Capital is the acanthus leaf in outward branching.

The many forms of the Fleur-de-lis is but the outward and inward branching of the standard units.

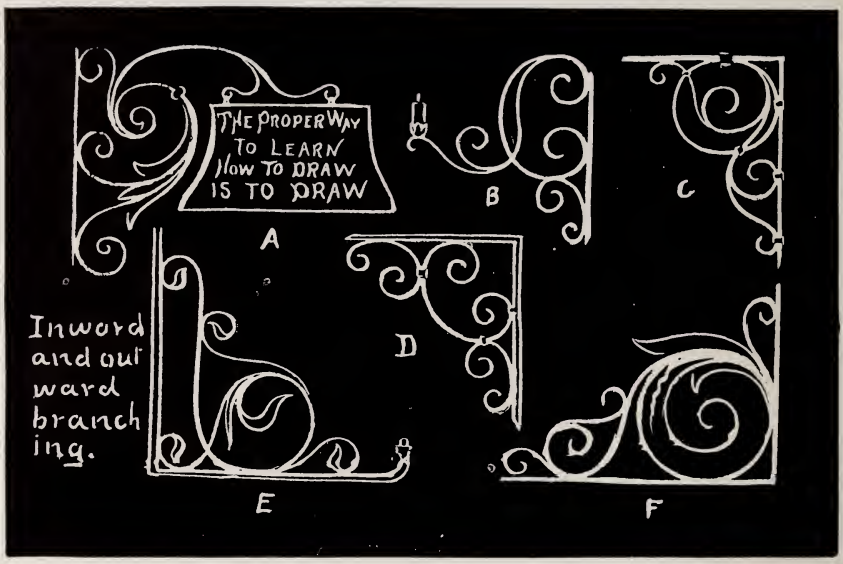


Fig. 5

Brackets. Fig. 5 represents some simple applications of outward and inward branching in the form of brackets. These are examples of bent iron work.

Drill Exercises

1. Represent a hanging bracket similar to A.
2. Represent a light bracket similar to B.
3. Represent a supporting bracket similar to C.
4. Represent a supporting bracket similar to D.
5. Represent a corner brace similar to E.
6. Represent a corner brace similiar to F.

Form is everywhere and its phases are infinite. It is all about us, and is the most numerous element that we see. All form can be used in decorative design, but to do so while learning the art would lead to confusion and failure. There are certain forms which can be made the basis of all form, both natural and conventional. The ones we use in this system of drawing are the five geometrical forms, — the triangles,

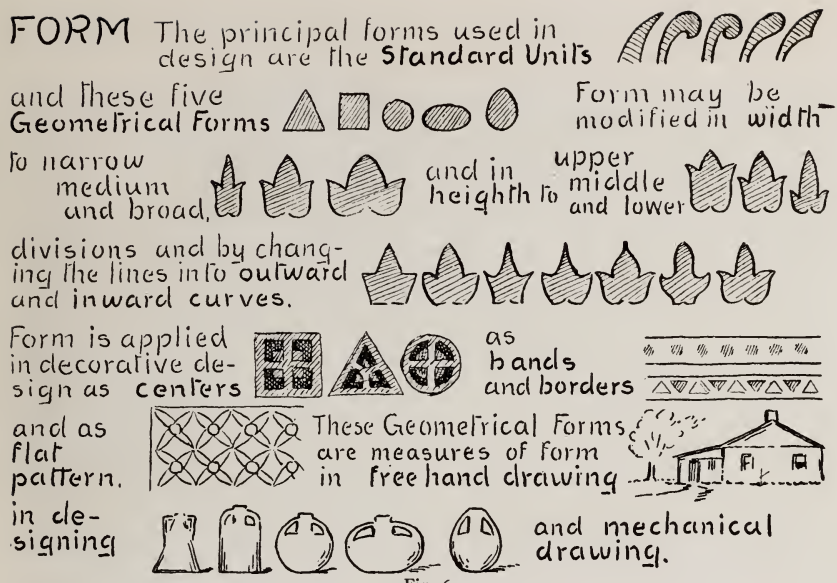


Fig. 6

rectangles, circles, ellipses, ovals, and the standard units as shown in Figs. 6 and 7. The geometrical forms are made the measure of practically all form and are taught in all grades beginning with the Third Year Book.

In decorative design the geometrical forms may be used as units and for that purpose they are excellent, but their greatest use is to give shape to the design — they are the basic forms in laying out the work. They are the measures of form for the designer the same as they are measures of form for the draughtsman.

Units in decorative design are the form parts that make up the design. Anything can be used as a unit, any form, natural or artificial, animal, vegetable or mineral, but because they are so numerous their general use would be confusing in the hands of one learning the art, but there are certain elements that are common to all units. These elements have been united as much as possible in the five standard units, and these are learned and used in place of using units promiscuously.

Most units and forms may be modified by changing their width to narrow, medium and broad, and many of them by dividing them into upper, middle and lower divisions, also by substituting the outward and inward curves, both double and single.

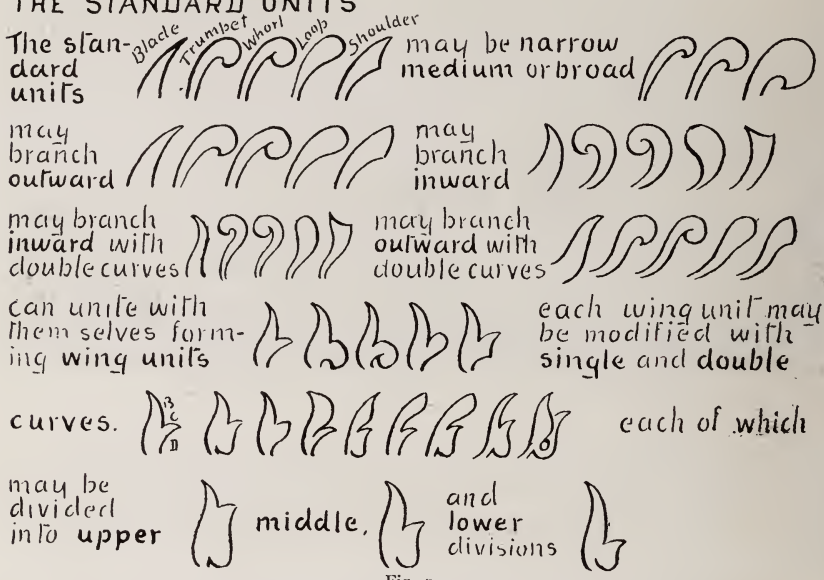


Fig. 7

The Standard Units are five units that combine in themselves, to a remarkable extent, the elements of nearly all units. Their names are the Blade, the Trumpet, the Whorl, the Loop and the Shoulder, each named from a real or fancied resemblance to the form after which they are named. It is practically impossible to use any and all units that may come to hand, or to leave their choice to chance. Such means would be confusing. So these five standard units are chosen, learned thoroughly and applied in the three ways that ornament is applied. A study of Fig. 7 will show their wide range in modification. In the fifth horizontal row the first unit is the blade united with itself, and those that follow are the lines A, B, C and D changed to outward and inward single and

double curves. The variation and adaptability of the standard units are practically unlimited. These units are taught in the Seventh Year Book.

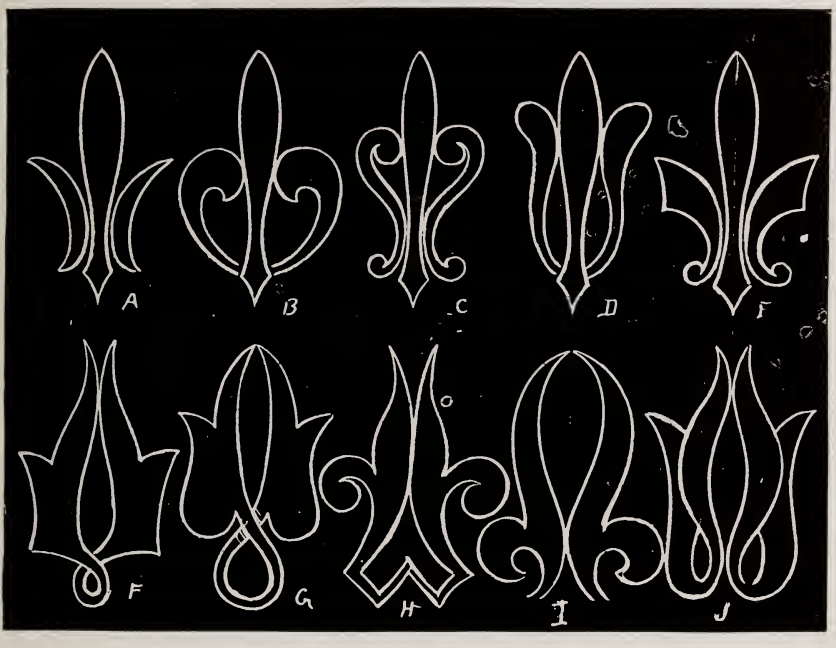


Fig. 8

Drill Exercises In Fig. 8, the upper horizontal row represents the standard units as arranged on each side of a stem after the manner of the *fleur de lis*. A is the blade in outward branching, B the trumpet in inward branching, C the whorl branching inward with double curves, and D the loop branching outward with double curves. E is the shoulder in outward branching with a whorl termination.

The lower horizontal row represents wing units doubled or arranged symmetrically without the intervening stem.

1. Draw four stems similar to the one in A and on each side represent the blade in outward branching, inward branching, double inward and double outward branching.

2. Draw four stems and represent the trumpet in the four ways of branching.

3. Draw four stems and represent the whorl in the four ways of branching.

4. Draw four stems and represent the shoulder in the four ways of branching.

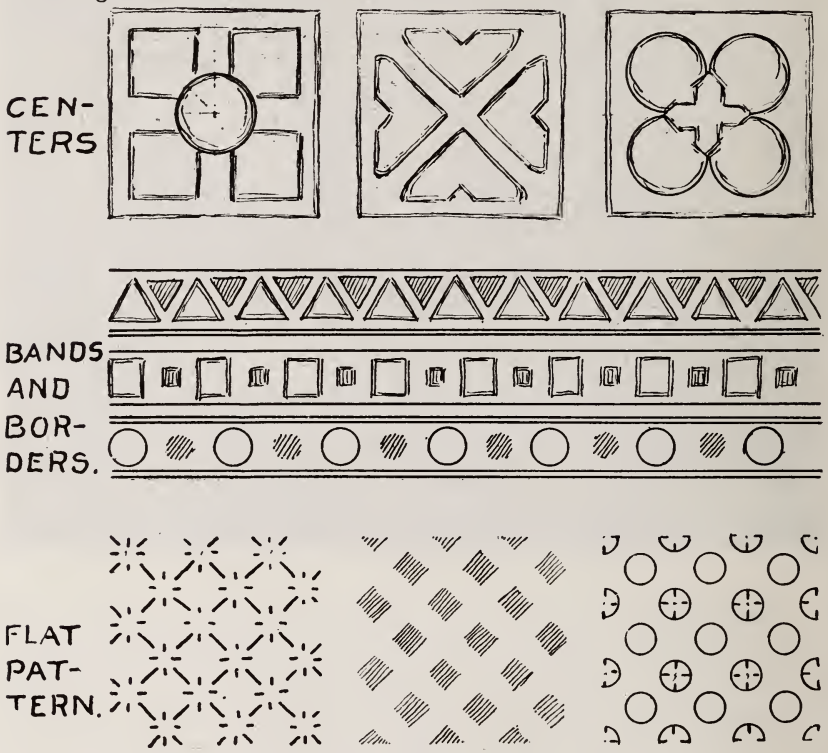


Fig. 9

Application of Ornament. Decoration is applied to objects in three ways — as centers, as bands and borders, and as flat pattern.

Centers are units arranged around a common point or center. They are usually based on the triangle or rectangle, though in shape they may be round, elliptical or diamond. A corner decoration may be considered a quarter of a rectangle.

Centers form the middle of rugs, carpets, ceilings, tiles or any inclosed space.

Bands and Borders are to surround or inclose space. They are to surround centers and flat patterns, to divide walls, ceilings and similar areas into fields, to divide vessels, columns and buildings into divisions, to form the hem, outer edge and stripes of garments, rugs and utensils.

Flat Pattern. Centers are units repeated around a point; bands and borders may be units repeated in a row, and flat pattern units repeated over a surface. Flat pattern is a general name applied to the decoration of an area or space. Examples are seen in wall paper, carpets, rugs, curtains and other draperies. The three methods of applying ornament are found in the Seventh Year Book.

Decoration is applied to that part of the great world of form that represents the handiwork of man. Anything that man makes can be decorated and the aim of this decoration is to please, to make his handiwork more beautiful, and better adapted to give him pleasure. Objects suitable for decoration may be divided into many groups of which the following are the most available:

Vessels. — Urns, vases, plates, dishes, inkstands, dippers, funnels, pitchers, mugs, goblets, bottles, etc.

Utensils. — Candlesticks, lamps, lanterns, candelabra, shields, helmets, swords, daggers, knives, forks, firearms, spoons, paper cutters, scissors, hand bells, door knockers, keys.

Furniture. — Chairs, stools, benches, sofas, tables, chests, desks, easels, beds, cradles, frames.

Jewelry. — Pins, buttons, pendants, rings, chains, bracelets, girdles, clasps, buckles, etc.

Endings. — Edges, fringes, mouldings, crowns, crosses, knobs, pendants, rosettes, and tassels.

Supports. — Legs, channelings, bases, shafts, capitals, balusters, consols and brackets.

Covers. — Parquet, mosaic, tiles, stained glass, mural, floor textile, lattice, book, etc.

It will be seen that any one of these divisions is too extensive to be used as a means of learning design. From the list it is better to choose one class of objects and through it learn to apply the various elements of design. We will choose a rectangular space and to it apply printed words in the form of book covers, programs, posters, book plates and similar objects.

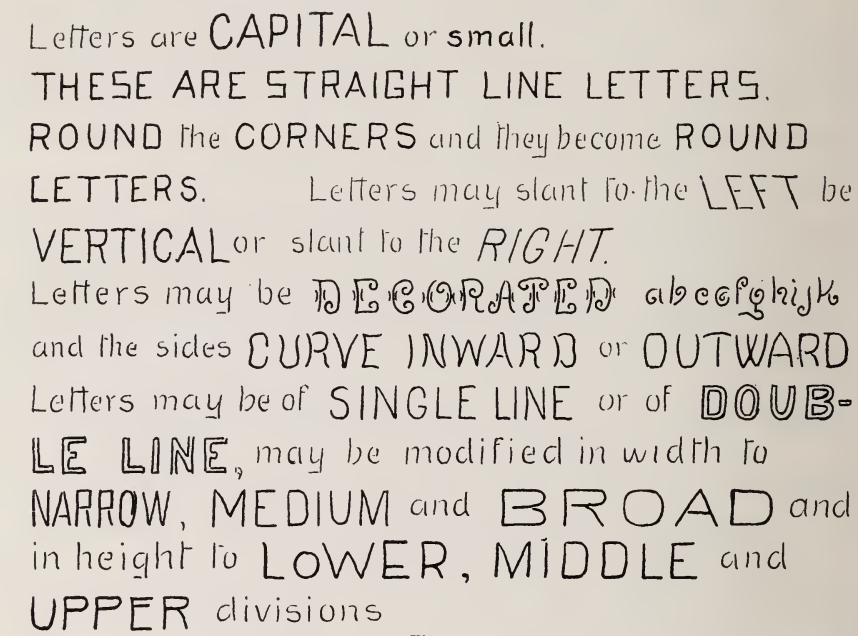


Fig. 10

Lettering. — A, Fig. 11 represents one of the most simple forms of large letters and D one of the most simple forms of small letters.

All of the capital letters are about the same width with the exception of I, M and W. I is a straight line and M and W somewhat wider than the other letters. The best way to learn the letters is to use them.

In the small letters b, d, f, h, k, l and t are a half higher than the body of the letter, and g, j, p, q and y are a half lower, as may be seen in F.

The figures are a half taller than the body of the letters.

B is an alphabet of upper division and C one of lower division.

E is one of the numerous alphabets that depart more or less from the regular letters.

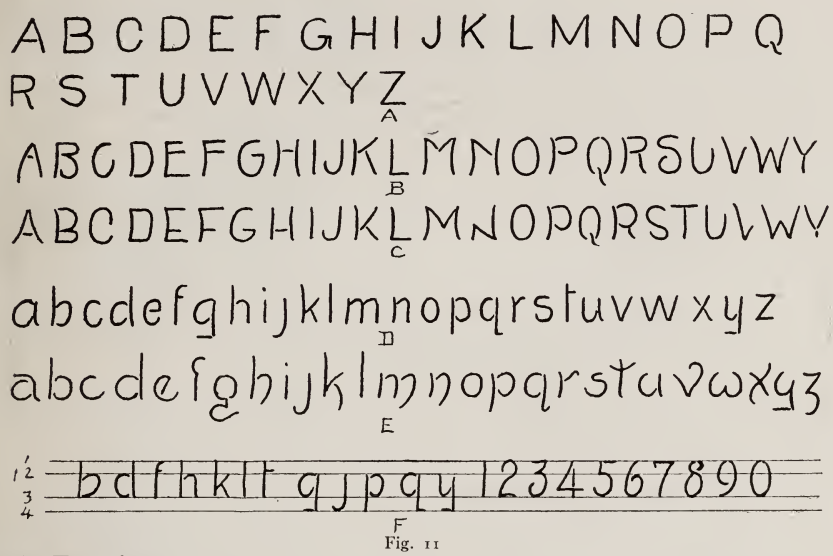


Fig. 11

Drill Exercises

Print the following exercises with small letters, using the large letters in their proper place:

1. Joy is not in things, it is in us.
2. The motive gives the quality to the act.
3. We keep the best things when we give them to others.
4. The law of right wrongs no one.
5. We alone can limit ourselves.
6. The fear of ill exceeds the ill we fear.

Print the following with large letters:

7. Pianos and Organs.
8. Hard and Soft Coal.
9. The Play and the Players.
10. Wit, Wisdom and Whims.
11. Map of North America.
12. Principal's office; hours from 10 to 12.

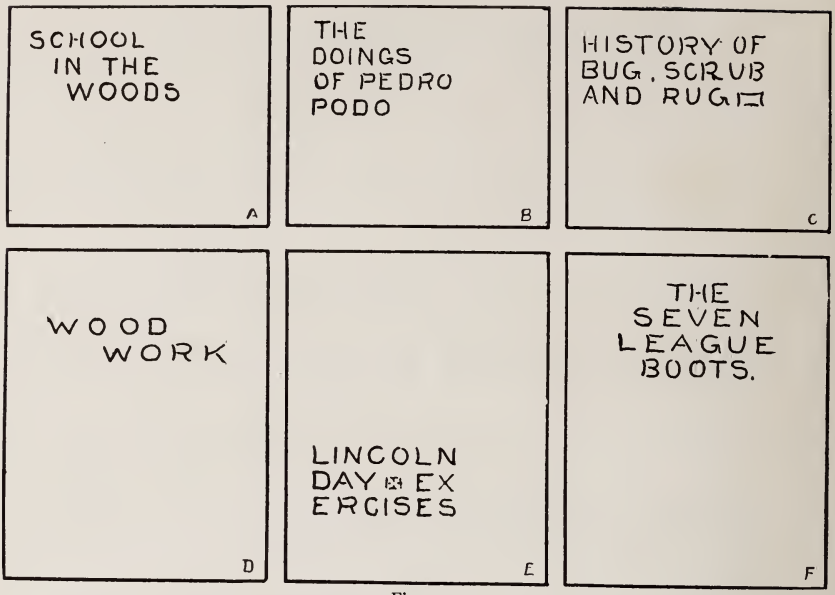


Fig. 12

Words in an Inclosed Space. Letters and words are usually fitted to a space, as on a book cover, calendar, program, advertisement or sign. The letters and words should fit these places agreeably, that is, be in pleasing proportion to them. The first to learn is the mechanical means of putting the words in place. In Fig. 12, are several of the most simple ways of arranging the words in the space. They represent the easiest ways from a mechanical standpoint.

In A, Fig. 12, S in the word "school" begins at an agreeable distance from the margin and ends where it will. The words "in the" begins one letter to the right and likewise ends free, and so with the word "woods." The number of letters in each line should be about equal.

In B, the words begin in a vertical line and end free.

In C, the words are arranged in the form of a rectangle, a rectangle being used to fill out the space at the end when the words do not come out evenly.

In D, the word "wood" begins on one side and ends free, and the

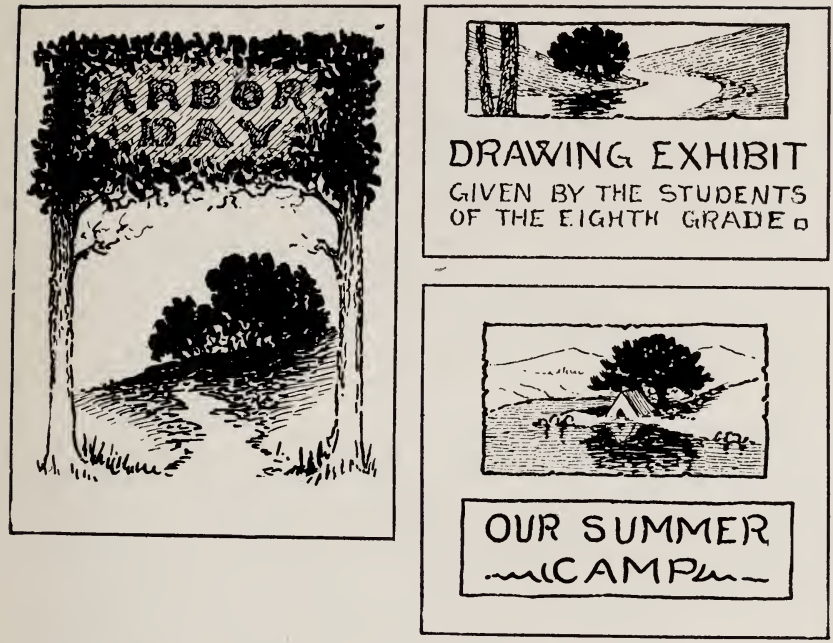


Fig. 13

word "work" begins on the opposite side with the letter K and is printed backwards. In this way it also ends free. K is as far from the right margin as W is from the left.

In E, the word "exercises" is divided. A word may be divided to form and complete a rectangular arrangement.

In F, is a symmetrical arrangement. A middle or median line is drawn and half the letters of each word are placed on each side of the line.

Drill Exercises

1. Print "Chop, Chin and Cho" after the manner of A.
2. Print "Chop, Chin and Cho" after the manner of B.
3. Print "Western Trails" after the manner of D.
4. Print "The White Stag" after the manner of F.
5. Print "The Doings of Byron Hansen" after the manner of E.
6. Print "Washington Day Exercises" after the manner of E.
7. Print "History of My Little Dog, Joe," after the manner of C.

3	1/16	2/16	5/16	7/16	11/16	1 2/16	1 13/16	2 9/16	3 2/16	3 5/16	3 7/16	3 11/16	4 2/16	4 13/16	6 9/16	
4	3/32	5/32	6/16	8/16	15/16	1 9/16	2 7/16	3 6/16	4 8/16	4 15/16	5 9/16	6 7/16	7 6/16	9 9/16	10 7/16	
5	2/16	3/16	5/16	8/16	13/16	1 4/16	1 12/16	3	4 3/16	5 8/16	6 4/16	6 12/16	7	8	9 3/16	
6	1/32	2/16	3/16	6/16	9/16	15/16	1 7/16	2 6/16	3 10/16	5	6 9/16	6 15/16	7 7/16	8 4/16	9 5/8	
7	1/16	3/16	4/16	7/16	11/16	1 2/16	1 11/16	2 6/16	2 13/16	4 3/16	5 14/16	7 11/16	8 2/16	9 11/16	10 2/16	
8	3/16	5/16	8/16	12/16	1 4/16	1 15/16	3 3/16	4 13/16	6 12/16	7 8/16	9 4/16	9 15/16	11 3/16	12 13/16	14 12/16	

Proportional Scales.— The numbers in each horizontal row are of an agreeable proportion approximately.

Fig. 14

Proportion (proper portion) rests largely with the judgment, with that indefinable something that governs our likes and dislikes. There are aids in judging proportion, such as proportional measurements, more or less helpful rules, and mechanical devices, but all of them should be subordinate to that taste or feeling that enables us to express our individual desire, and which, more than anything else, leads to growth and power. "I like that," "This pleases me," are expressions of growth in representing agreeable proportion. But rules, proportional measurements and mechanical devices have their place, and may be used with both profit and success. For example, the following rule is helpful:

The most pleasing proportions do not vary by equals, doubles, triples and quadruples, but by a more subtle arrangement that is not so easily discernible. This rule applied to a rectangle, would say a rectangle in the proportion of 2 x 2, 2 x 4, 2 x 6 or 2 x 8, is not as pleasing as one 2 x $1\frac{1}{4}$, 2 x $2\frac{1}{2}$, 2 x $3\frac{1}{4}$, a more subtle proportion.

In the above table of proportional scales will be found agreeable proportions for lines or spaces 3, 4, 5, 6, 7, and 8 inches long, as given in the first vertical row. The numbers that follow in the horizontal row are of agreeable proportion with the first number and among themselves. For example, a rectangle 3 x $1\frac{2}{16}$ inches or 3 x $4\frac{2}{16}$ inches or 3 combined with any number in the row would form a rectangle of agreeable proportion, or a rectangle formed by any two numbers in the same row

would be of agreeable proportion. These scales are not accurate, but are approximately so.

The uses of these scales are:

To construct rectangles that are of agreeable proportion, and to subdivide these rectangles into panels suitable for letters, drawings, and decorative units. Also to give the width of bands and borders and the spaces they are to occupy. Use them freely.

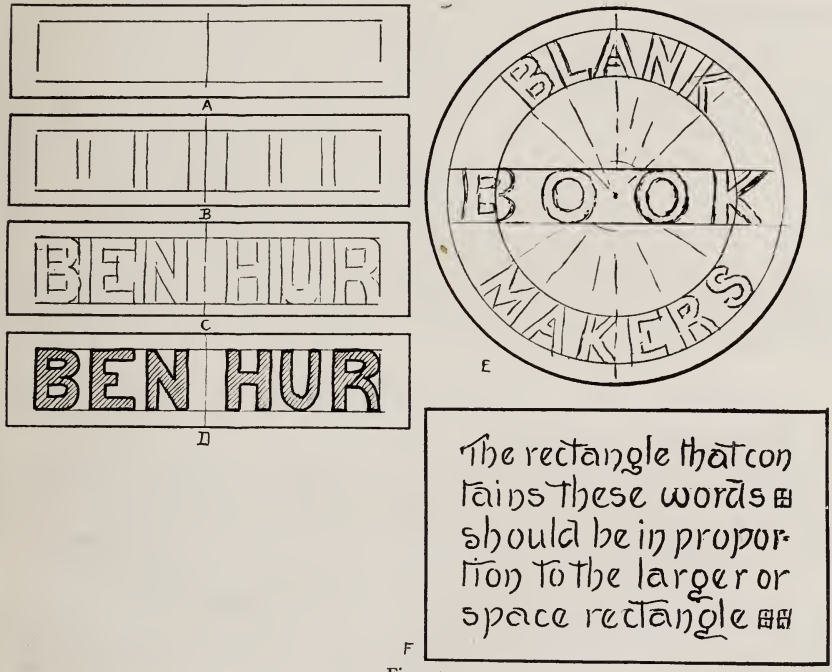


Fig. 15

Fitting Words to a Space. The process of fitting words to a space is as follows. Let A, Fig. 15, be the space and Ben Hur the words to be inclosed. Draw the inclosed space and then the space for the letters. These two spaces should be proportional — that is, they should fit each other agreeably.

Divide the space into seven parts as in B, working from the middle line each way, and making the space of about the width of one letter.

Mark in the letters with light lines as in C, and finish as in D.

Letters and words should fit the space agreeably. E shows the manner of fitting words to a circular space, and F to a rectangular space but does not show how to make them proportional. This is left to the judgment or to the proportional scales in Fig. 14.

Drill Exercises

1. Fit the words Ben Hur to a 5 x $1\frac{1}{4}''$ space.
2. Fit the word Calendar to a 5 x $1\frac{1}{4}''$ space.
3. Fit the word March to a 5 x $1\frac{1}{4}''$ space.
4. Fit the words Lincoln Day Program to a 5 x $1\frac{3}{4}''$ space. Use two lines.
5. Fit the words Christmas Greeting to a 5 x $1\frac{3}{4}''$ space.
6. Fit the words The White Stag to a circular space similar to E.
7. Fit the words Fine Leather Goods to a circular space.
8. Fit the following notice in a space 5 inches wide and long enough to accommodate the reading, after the manner of F, Fig. 15: "Drawing Exhibit at the Lincoln School, Friday Afternoon, February 6, 1920, at 3 o'clock, by the Students of the Eighth Grade."

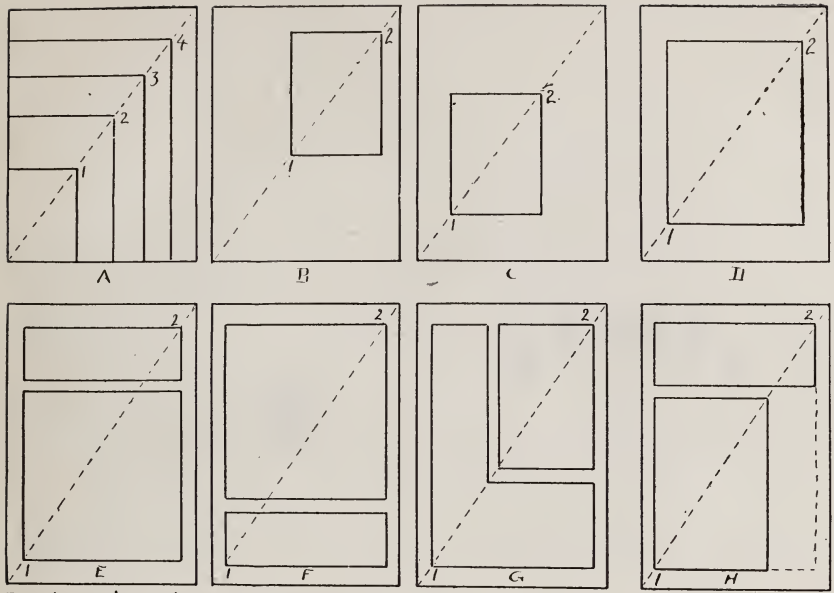
The Diagonal Line. The diagonal line may be used to divide a rectangular space agreeably.

Draw a rectangle and through it a diagonal line as in A, Fig. 16, on this line choose points 1, 2, 3 and 4 anywhere in the line. From each point draw a vertical and a horizontal line. The rectangles thus formed will be proportional to the large rectangle and to one another.

As in B, C, and D, draw a large rectangle and a diagonal. Choose two points in this diagonal as 1 and 2 and from each draw a vertical and a horizontal line; the resulting rectangle will be proportional to the large rectangle.

In E, F, G, and H, the large inclosed rectangle is subdivided into two parts. This is done by the unaided judgment. In Fig. 17, design A was drawn by a proportional scale and B by the aid of the diagonal line.

These two ways may be combined in the same drawing.



Rectangles divided proportionally by means of a diagonal line

Fig. 16

Drill Exercises

1. Print the words "Class Record" in a cover similar to B, Fig. 16.
2. Print the words "Class Day Program" in a cover similar to C, Fig. 16.
3. Print the words "The Secret Cave" in a space similar to D.
4. Choose E, F, G or H, for an "Arbor Day program."
5. Choose E, F, G or H for a "Thanksgiving Day program."
6. Design a calendar similar to E, F, or H.
7. Design a "Sketch Book" cover similar to G.
8. Design a "Menu" card similar to E or H.
9. Design a "Laundry" card similar to H.
10. Design an "Easter Greeting" similar to F.
11. Design a "New Year's Greeting" similar to D.
12. Design an advertising card for a "Drawing Exhibit" similar to D.
13. Design a book cover with the words "The Red Chief" similar to F.

Fig. 17

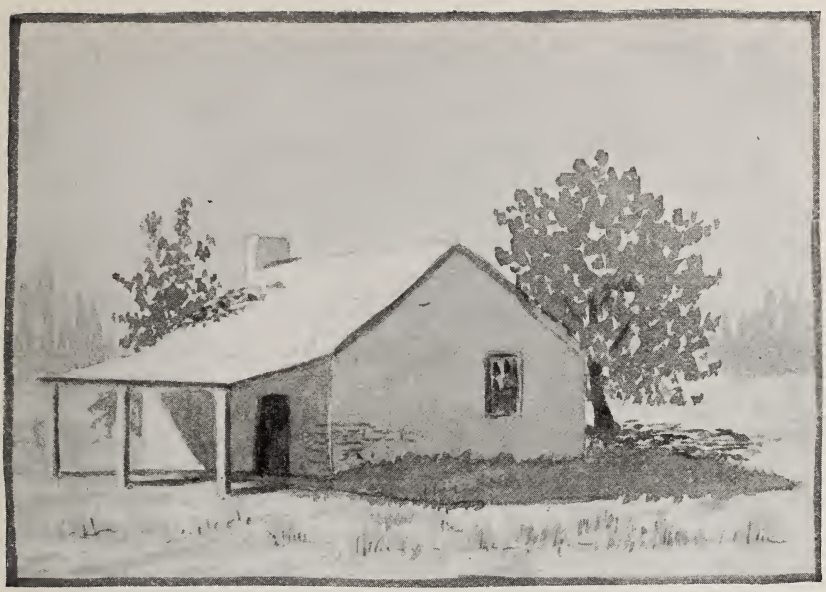


Fig. 1

COLOR

The Essential Elements of Color are:

The Standard Colors.
The Primary Colors.
The Secondary Colors.
Complementary Colors.
Tones, Tints and Shades.
Hues and Values.

And the mechanical means of learning these elements are:

The Plain or Flat Wash.
The Over Wash.
The Graded Wash and
The Broken Washes, both wet and dry.

These four washes represent the mechanical means of learning color, making pictures and coloring designs.

The Standard Colors are pure colors, which, by common consent, are accepted as standards. They are red, orange, yellow, green, blue, and violet. Of these colors, red, yellow and blue are called primary colors, and orange, green and violet are called secondary colors.

Warm and Cold Colors. Colors tending toward red and orange are called warm; those tending toward blue and violet are called cold. Grays mixed with warm color are called warm grays, and those mixed with cold color are called cold grays.

Luminous colors are those tending toward yellow. Yellow is the most luminous color, and represents more than any other color the element light.

A positive color is a decided or striking color, like red, yellow or violet. **A passive color** is a quiet color, like gray.

Green is a neutral color, intermediate between the warm and luminous colors red, orange and yellow and the cold colors blue and violet. Warm and cold colors play a very important part in harmonious coloring.

Tones, values, tints, shades, and hues are terms indicating change in color.

Tone is the general term indicating any kind of change in color. There may be tones of tints, shades and hues. Tones of red, orange, yellow, green, blue and violet, warm tones and cold tones, bright tones and dull tones; in fact, any variation is a tone.

Value is the measure of color as compared with white and black. It is the lightness and darkness of the tones irrespective of the color. It is the relative strength of the washes as they enter into and become a part of the picture or design. Tints, shades, hues, complementary tones, and secondary tones all become values as they enter the picture as washes.

Tints are the lighter tones of a color and shades are the darker tones. The color itself is the dividing point between the tints and shades. For example, make yellow lighter and tints of yellow are formed. Make it darker and shades of yellow are formed.

Hues are the tones between two adjacent colors. The tones that connect two adjacent Standard colors would be hues.

A Scale is an orderly series of tones. There may be scales of value,

of tints, of shades, of hues, of complementary tones, and of secondary tones, scales of warm tones, of cold tones, of bright tones or of dull tones.

PRIMARY COLORS { RED + YELLOW = ORANGE; YELLOW + BLUE = GREEN; BLUE + RED = VIOLET } SECONDARY COLORS

THE STANDARD COLORS WITH ONE INTRMEDIATE COLOR BETWEEN

RED
RED ORANGE
ORANGE
YELLOW ORANGE
YELLOW
YELLOW GREEN
GREEN
BLUE GREEN
BLUE
BLUE VIOLET
VIOLET
RED VIOLET
RED

COMPLEMENTARY COLORS.

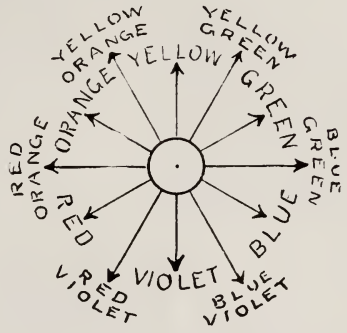


Fig. 2

Complementary Colors and Tones. It will be seen from a study of Fig. 2, that the primary colors red, yellow and blue, blended or mixed together by twos, form the secondary colors orange, green and violet, and that the standard colors are the primary and secondary colors taken together.

Intermediate colors are additional steps between the primary and secondary colors. For example, one step between these colors would be named as follows: Red, **red orange;** orange, **yellow orange;** yellow, **yellow green;** green, **blue green;** blue, **blue violet;** violet, **red violet,** and red as shown in Fig. 2, thus forming the color **circuit.**

It is necessary that the three primary colors be present in the picture to make complete color harmony, but the beginner in color finds it difficult to handle three colors successfully. To reduce the number of colors and still make it possible to have complete color harmony, complementary colors are used.

Complementary Colors are two colors that unite in themselves the three primary colors. The complementary colors are therefore:

Red and green (green is yellow and blue blended).

Yellow and violet (violet is red and blue blended).

Blue and orange (orange is red and yellow blended).

In Fig. 2, the opposite colors as indicated by the arrows are complementary.

Observe that the difference in value between yellow and violet is very wide, between blue and orange less wide, and that red and green are of nearly the same value.

To gray a color is to add some color that will dull its brightness and make it more passive — like gray. Complementary colors are made gray by blending or mixing them together. Secondary colors mixed together by twos also form grays.

The Mechanics of Water Colors. Water colors are applied in washes. A wash is water tinted with color and then, by means of a brush, spread more or less evenly over the surface to be painted. A water-color drawing or painting is a number of superimposed washes representing a definite idea.

The washes in this course are known by their number. A wash 1 is the lightest, wash 2 is a tone stronger, wash 3 three tones stronger, and a wash 6 is six times stronger than wash 1. A color can be divided into any number of washes, but six are enough for practical purposes, and the number is the best name that can be given to the wash to designate its relative strength. This gives a scale with white at one end and the full color at the other, and six intermediate tones. A wash may represent a tint, shade, hue or value.

Preparing the Wash. Prepare the wash as follows: (1) Dip the brush in water and press it into one of the compartments in the cover of the box. Do this until there is water enough in the compartment for the wash. (2) Rub off a little color with the brush, and mix it with the water in the compartment. It is now ready to apply to the paper.

Applying the Wash. Grasp the water-color pad with the left hand and incline it at an angle of about forty-five degrees. Dip the brush in the wash, and apply the color with a full brush, working from the top

downward. Keep the brush full of the color wash. The superfluous color that is left at the bottom may be removed by drying the brush on the cloth and then taking up the extra color by touching it with the dried brush. A wash dries in a few minutes, and then another wash may be placed over the whole or part of the design at pleasure. These superimposed washes constitute the water-color picture.

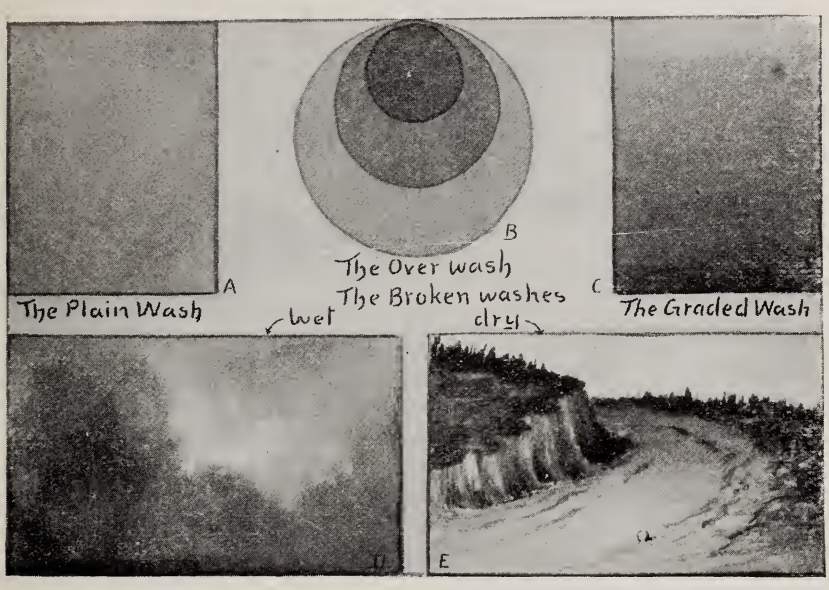


Fig. 3

The Washes. The kinds of washes used in water color painting are:

The plain or flat wash.
The over wash.
The graded wash, and
The broken washes, both wet and dry.

These washes include practically all of the mechanical difficulties of water color painting. With these washes colors are divided into tint tones, shade tones, hue tones, complementary tones, pictures are painted and designs are colored, thus practically covering the whole mechanical field of color.

A Plain or flat wash is a single wash spread more or less evenly over a surface. It is the single application of the color. A, Fig. 3. It is taught in the Fourth Year Book.

The Over wash is placing one wash over another as shown in B. In B, the light wash was placed over the whole design. When dry, the medium wash was added, and when that was dry, the dark wash. It is taught in the Fourth Year Book.

The Graded wash varies from light to heavy or from heavy to light as in C, Fig. 3. It is taught in the Sixth Year Book.

The Broken washes are divided into wet and dry. The wet wash is placed on wet or moist paper and the dry wash on dry paper, as shown in D and E. It is taught in the Seventh Year Book.

The Standard Colors and how their tints, shades, hues and complemenary tones are formed. Also the leading characteristic of each color:

Standard Colors	Tints	Shades	Hues	Complementary	Characteristic
Red	Water	Warm Gray	Violet or Orange	Green	Warm
Orange	"	Warm Gray	Red or Yellow	Blue	Warmer
Yellow	"	Warm Gray	Orange or Green	Violet	Light
Green	"	WG or CG	Yellow or Blue	Red	Neutral
Blue	"	Cold Gray	Green or Violet	Orange	Colder
Violet	"	Cold Gray	Blue or Red	Yellow	Cold

Mixing Colors. The result of mixing each primary color with the remaining standard colors and grays:

Red + Orange = the Orange hues of Red.
Red + Yellow = the secondary color Orange.
Red + Green = the complementary tones of Red.
Red + Blue = the secondary color Violet.
Red + Violet = the Violet hues of Red.
Red + Warm Gray = the shades of Red.
Red + Cold Gray = Black.

Yellow + Red = the secondary color Orange.
Yellow + Orange = the Orange hues of Yellow.
Yellow + Green = the Green hues of Yellow.
Yellow + Blue = the secondary color Green.

Yellow + Violet = the complementary tones of Yellow.
Yellow + Warm Gray = the shades of Yellow.
Yellow + Cold Gray = Green tones of Gray.

Blue + Red = the secondary color Violet.
Blue + Orange = the complementary tones of Blue.
Blue + Yellow = the secondary color Green.
Blue + Green = the green hues of Blue.
Blue + Violet = the violet hues of Blue.
Blue + Warm Gray = the Green tones of Gray.
Blue + Cold Gray = the shades of Blue.
Warm Gray + Cold Gray = neutral Gray.

The Secondary colors mixed together or blended as:

Orange and violet,
Green and orange,
Violet and green,

form colored grays, or secondary tones.

Materials. — The minimum materials used in water color painting are:

A box of water colors.
A tablet of white drawing paper.
A cup to hold water, and
A piece of cotton or linen cloth.

The water color box that seems to give the best satisfaction, that is the easiest to learn and teach, is the one containing the six standard colors and two grays, a warm gray or brown and a cold gray or blue black. Such a box with perfect colors would be complete. A camels' hair brush comes with the water-color box. This is enough for ordinary use; still, a smaller brush also will be found useful. A No. 3 sable brush is also an excellent brush to use for fine work.

A water color tablet $4\frac{1}{2}$ x 6″ is an excellent size for drill purposes and ordinary practice. The 6 x 9″ and 9 x 12″ tablets are the next in size.

The water cup should be low, of broad base, so it will not tip over, and should hold at least a half pint of water.

The cloth is to be used as a blotter to dry the brush and to clean the

box. Old cotton, or linen cloth, free from starch and that will absorb water readily, is what is needed.

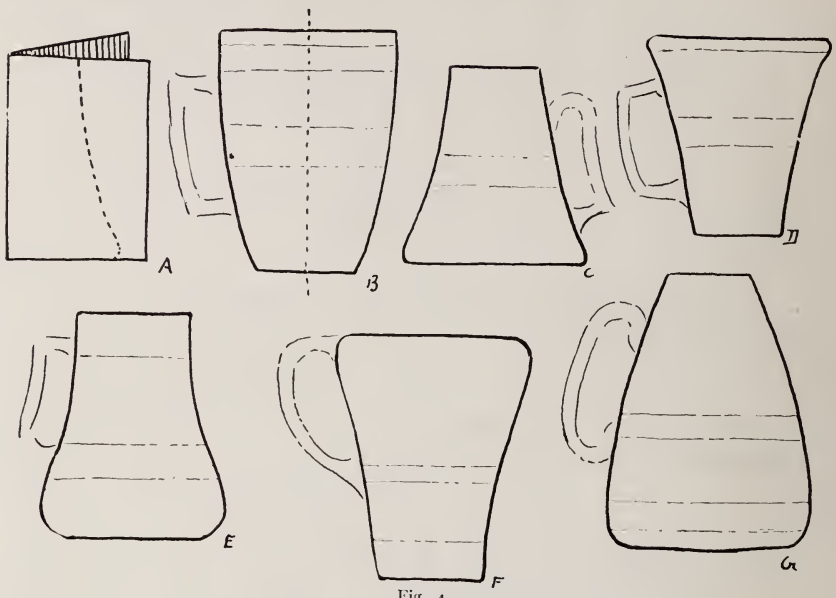


Fig. 4

Review

Fig. 4 represents several mugs with a suggestive handle attached to each. These mugs are to be used for review work in color.

Take a sheet of drawing paper and fold it as shown in A. With scissors cut through the doubled sheet, cutting out the shape of the mug you are to use as suggested by the dotted line. After cutting out the shape, study the proportion, and trim until the proportion is satisfactory. Draw on the tablet a light vertical line. Lay the mug pattern on the vertical line in such a manner that the line will correspond to the crease of the fold. Mark out the bowl of the mug and draw the handle, and the divisions for the color work and it is ready to be painted.

B, C, D, E, F and G are suggestive shapes for the mugs and attached to each is a suggestive handle. Care must be taken to make the handle in proportion to the bowl of the mug.

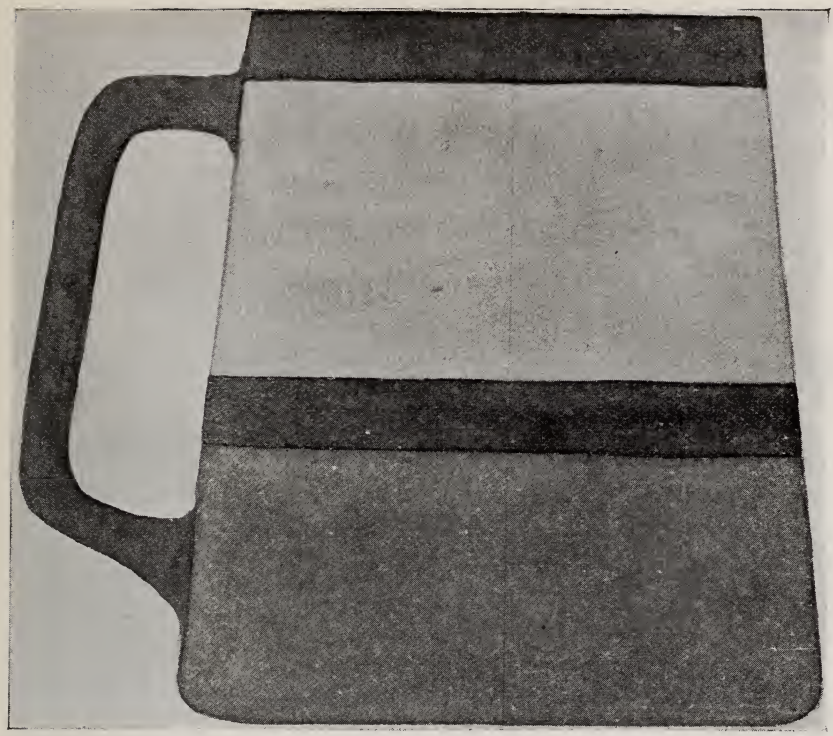


Fig. 5

Fig. 5 represents a stone mug painted in three values. The upper division we will call the body, the lower division the base, the middle stripe, the band, and the upper stripe, the border. These may be varied in value and color according to the judgment.

In colored plate 1 is the mug painted with the complementary colors, red and green. The two mugs are alike in shape, but the values and tones vary.

The mug may be painted with the plain and over washes, the graded wash or the broken washes. An excellent plan is to place a general wash over the whole mug and when dry to paint the base, then the band, border, and handle.

Drill Exercises

1. Paint a mug with the tints of green.
2. Paint a mug with the shades of green.
3. Paint a mug with the yellow hues of green.
4. Paint a mug with the blue hues of green.
5. Paint a mug with the complementary tones of green.
6. Paint a mug with the complementary colors red and green. Paint the body green, the base red and the band, border and handle with the two washes combined.
7. Paint a mug with the secondary tones of green and violet.
8. Paint a mug with the secondary tones of green and orange.

Any of the standard colors may be used in the same manner as the green in the above exercises. Go through the same processes with red, then with orange, then with blue.

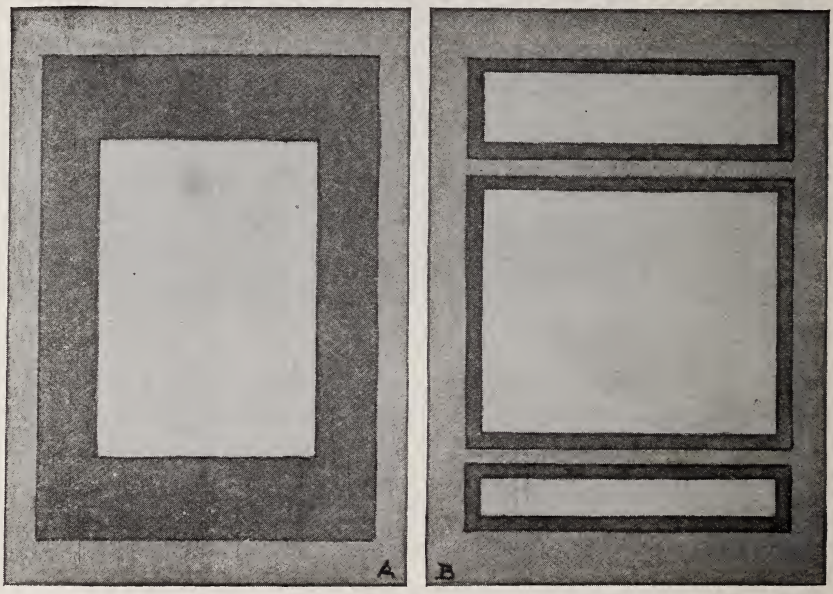
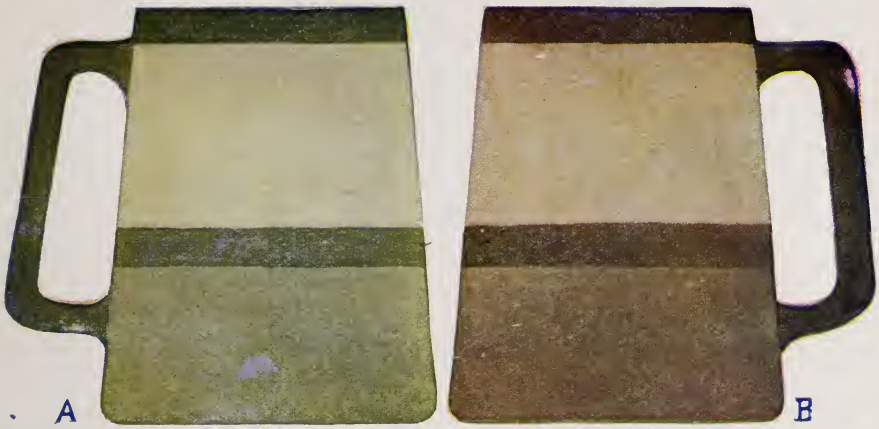
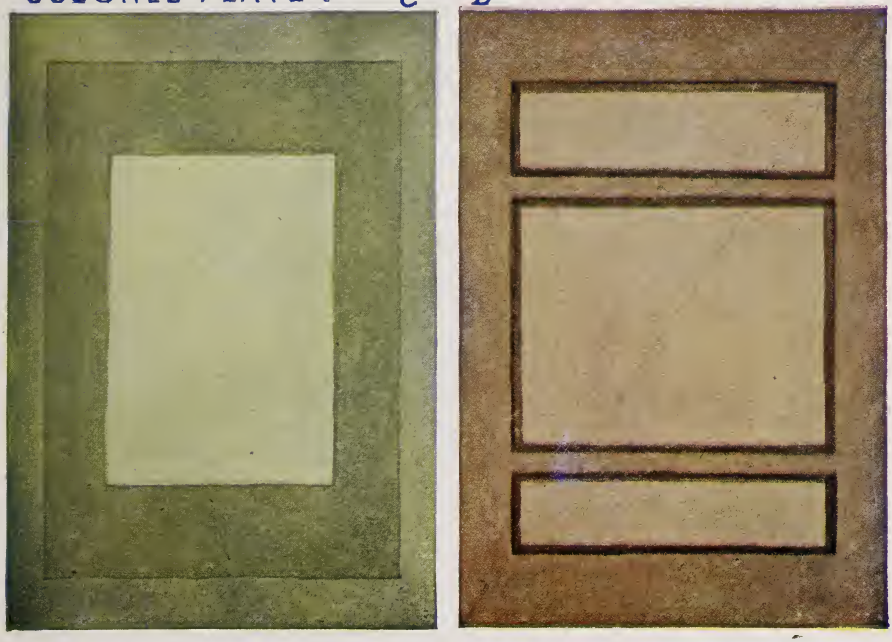


Fig. 6

Cover Designs. Fig. 6 represents two designs suitable for book covers, calendars, menu cards, special day programs, Christmas and



COLORED PLATE I



New Year greetings and similar uses. The designs may be decorated with special day symbols, such as trees for Arbor Day, holly or mistletoe for Christmas, or pumpkins and squashes for Thanksgiving Day.

Stencils may be made of each design by cutting a cardboard the required size, and then cutting out the light parts. It may then be laid on the tablet and marked out.

C and D, colored plate 1, are the designs painted with the complementary colors red and green.

The design may be painted with any of the standard colors as given below in the drill exercises. Blue is given as an example.

Drill Exercises

1. Paint design A with the tints of blue.
2. Paint design A with the shades of blue.
3. Paint design A with the green hues of blue.
4. Paint design A with the violet hues of blue.
5. Paint design A with the complementary tones of blue.
6. Paint design A with the complementary colors blue and orange.

In like manner design B may be painted with any of the standard colors.

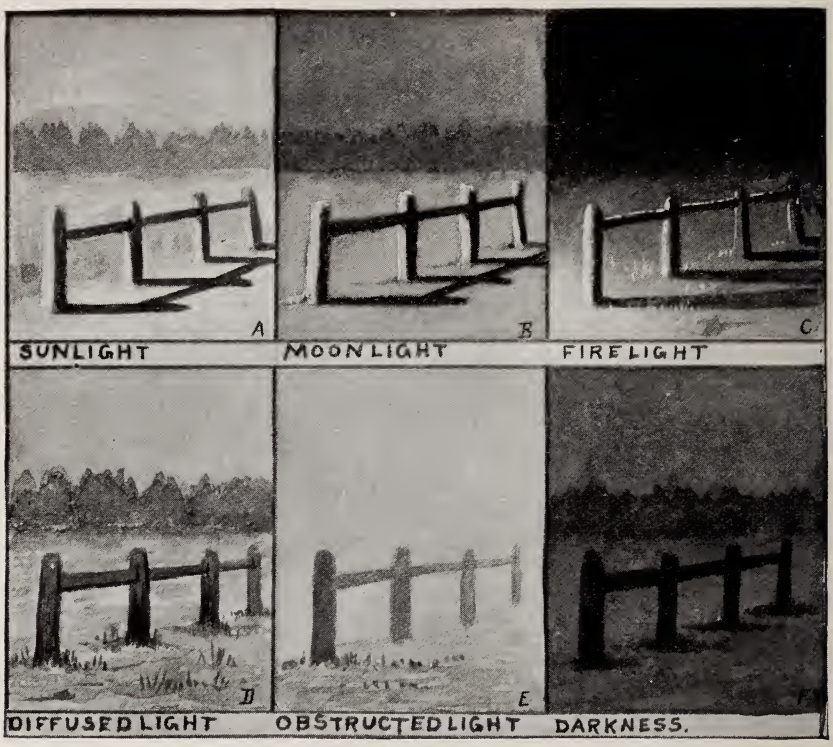


Fig. 7

LIGHT AND SHADE

Light. There are two general classes of light — direct light A, B and C, Fig. 7, and indirect light D, E and F.

Direct light is characterized by strong contrasts between the lights and shades. Both the shades and shadows are definite and distinct, while in indirect light the lights and shades are not separated by any perceptible demarcation, and there is little or no shadow.

Direct light is of three kinds—sunlight, moonlight and artificial light.

Sunlight. In sunlight, the tones are very light, the shades and

shadows are medium dark and in sharp contrast with the light, they are definite and distinct and seem darker than they are in reality.

Moonlight. Moonlight is very similar to sunlight. The chief difference is that the tones are darker. Pass a heavy plain wash over a sunlight picture and it will give the effect of moonlight.

Artificial light is such as comes from fire, lamp, candle and electric light.

Sunlight, moonlight and artificial light differ mainly in the volume of light, the sun floods the whole picture with bright light, the moon with a less quantity, and artificial light with a less quantity still. Sunlight and moonlight are broad in effect, lighting the whole picture evenly; artificial light is more local and confined to a small area. Distant objects are not seen in artificial light.

Indirect light is also of three general kinds — diffused light, obstructed light and darkness.

Diffused light is such as exists on cloudy days. The details show plainly; there is little or no shadow; the lights and shades are not separated by any perceptible demarcation; the tones are medium and the values normal.

Obstructed light is light obstructed by fog, haze, smoke, storm, and similar conditions. These tend to eliminate distance, shade, shadow, and details, and tend to make all objects of an even gray color. In a stormy picture the oblique lines predominate and fill the picture with motion.

Darkness is the absence of light. The tones are dark and the details few. The shades, shadows, and details are lost in the dark values. Darkness does not necessarily eliminate distance.

These general divisions of light are not distinct, but merge into one another imperceptibly. They are taught separately for convenience in teaching.

In general the essential features of each light may be summed up as follows:

Kinds of Light	Contrasts in Light and Shade	Shades and Shadows	Tones	Details
Sunlight	Very Sharp	Medium	Light	Medium Plain
Moonlight	Medium Sharp	Dark	Dark	Few
Artificial Light	Sharp	Dark	Dark	Few
Diffused Light	Slight	Show Little	True	Very Plain
Obstructed Light	Very Slight	None	Medium	Few
Darkness	Slight	None	Dark	Very Few

The above table is not to be taken too literally, but merely as a general aid to the judgment and to assist observation.

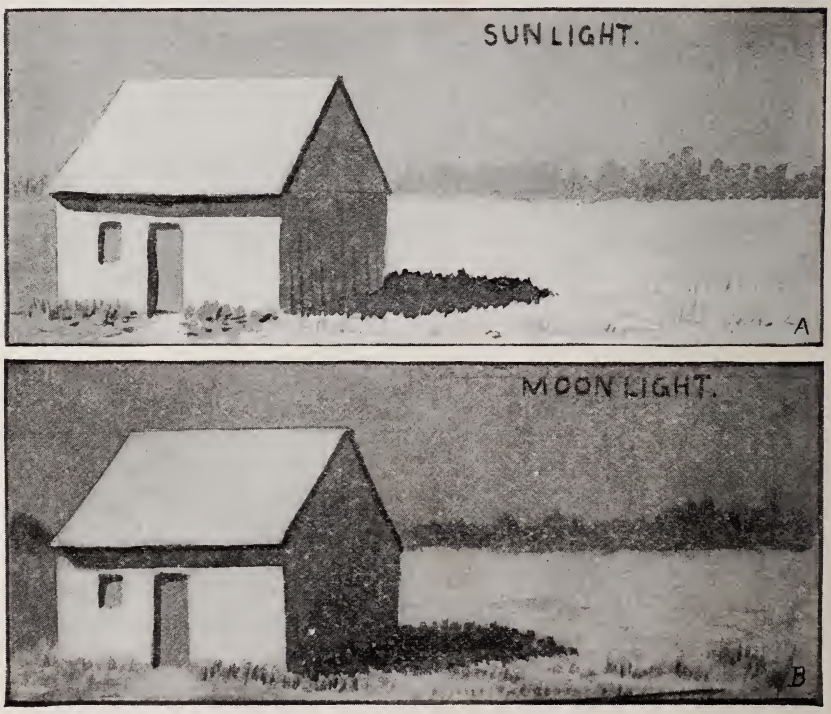


Fig. 8

COLORED PLATE 2

Sunlight and Moonlight effects are very similar in their mechanical construction. The chief difference is in the values, that of sunlight being light and of moonlight dark. So true is this that a heavy wash over the sunlight, drawing A, would turn it into the moonlight B. Colored plate 2 is painted with the complementary colors blue and orange. One represents sunlight, the other moonlight.

Drill Exercises

1. Paint A, Fig. 8, entirely in cold gray.

2. BLUE AND ORANGE. Paint the sky a very light tint of blue and the distant wood a stronger tint. Paint the middle distance, foreground, roof and sides of the house with a broken wash of blue and orange. Let the blue predominate in the middle distances, shades and shadows. Let the orange predominate in the roof, front of the house and foreground. Paint the whole picture in the following order: sky, middle distance, foreground, roof, front of house, shades, shadows and last the distant forest.

3. YELLOW AND VIOLET. Paint the picture in the same manner as Exercise 2.

4. COLD GRAY. Paint B, Fig. 8, entirely with cold gray or black.

5. BLUE AND ORANGE. Paint the moonlight B as follows: Paint the whole picture with blue and orange mixed together, letting the blue predominate in the sky, distant wood, middle distance, and the orange in the foreground and the roof and front of the house. The shades and shadows should be about neutral.

6. YELLOW AND VIOLET. Paint the moonlight picture B in the same manner as Exercise 5, letting the yellow take the place of the orange and the violet of the blue.

Fig. 9

Sunlight. Fig. 9 represents another sunlight picture similar to A, Fig. 8. Paint it as given below.

Drill Exercises

1. Cold Gray. Paint Fig. 9 entirely with tints of cold gray. Use the broken wash in the foreground.

2. Cold Gray. Paint Fig. 9 as a moonlight picture. This is done by simply making the tones darker. In other words, by painting Fig. 9 darker it becomes a moonlight.

3. Blue and Orange. Paint the sky and distant forest blue. The middle distance, foreground and tent blue and orange mixed together. Paint the foreground with broken washes. Let the blue predominate in the sky, distant forest, middle distance, shade and shadows. Let the orange predominate in the foreground. The roof of the tent may be left white. Paint the picture in the following order: Sky, middle distance, foreground, tent and distant forest.

4. Yellow and Violet. Paint the same as in Exercise 3, using the violet in place of the blue and the yellow in place of the orange.

5. Yellow and Violet. Paint Fig. 9 as a moonlight. Paint the sky, distant forest, and middle distance with yellow and violet letting the violet predominate. Paint the foreground with the same, but let the yellow predominate. The tent may be painted in neutral color, that is, in color in which neither the yellow nor the violet predominate.

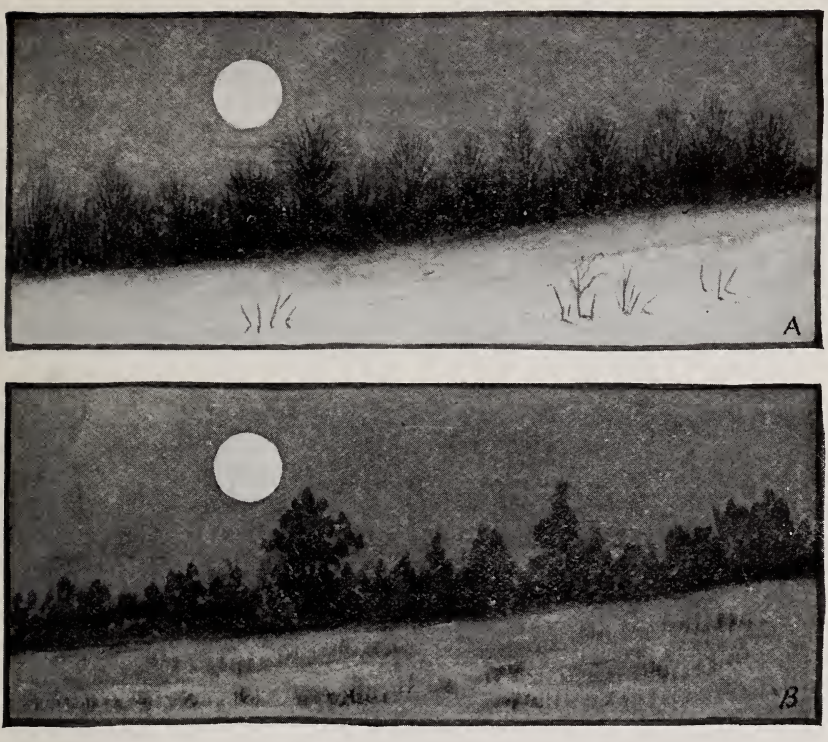


Fig. 10

Fig. 10 represents two very simple moonlight pictures. The upper one represents moonlight in winter and the lower one moonlight in summer. Both are painted as follows: Mark a circle for the moon and paint the sky as a plain wash, and then the foreground. When dry, paint the wood and the details in the foreground.

Drill Exercises

1. Paint moonlight B entirely with cold gray.
2. BLUE AND ORANGE. Paint moonlight A with blue and orange mixed together, letting the blue predominate in the sky and foreground and making the wood neutral. Paint the moon with a very light wash of yellow.
3. BLUE AND ORANGE. Paint moonlight B the same as A, but let the orange predominate in the foreground.

4. Yellow and Violet. Paint moonlight A with yellow and violet mixed together letting the violet predominate in the sky and foreground and making the forest about neutral. Paint the moon with a very light wash of yellow.

5. Yellow and Violet. Paint moonlight B the same as A, but let the yellow predominate in the foreground.

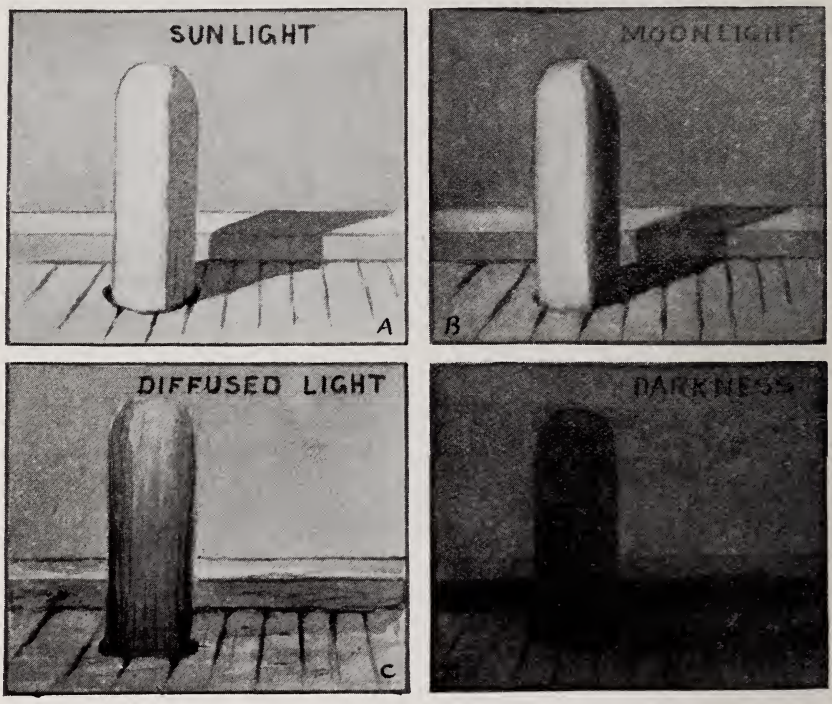


Fig. 11

Contrasts. In Fig. 11, the sunlight A is contrasted with the moonlight B, and the diffused light C with the darkness D.

As the sunlight and moonlight effects are similar so are the diffused light and darkness effects. The general difference is that in diffused light the medium tones predominate and the details show plainly, and in darkness the dark tones predominate and the details are lost in the dark

tones. These are very broad distinctions. In reality, each phase of light has infinite variations and conditions, but if the large distinctions are gained then we can see the smaller ones to better advantage. In all of these drawings only the broad distinctions are given.

Drill Exercises

1. Warm Gray or Brown. Paint the post C in warm gray.
2. Paint post D with warm gray.
3. Paint post C with cold gray or black.
4. Paint post D with cold gray or black.

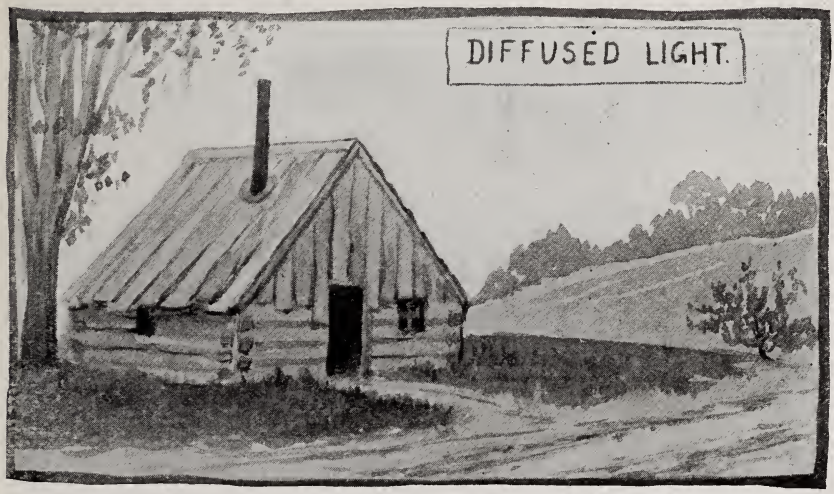


Fig. 12

Diffused Light and Darkness. Fig. 12 represents a picture in diffused light and Fig. 13 the same one in darkness. The chief difference between the two is that in the diffused light the details show plainly and in darkness they are lost in the dark tones. Colored plate 3 represents the same drawing in color.

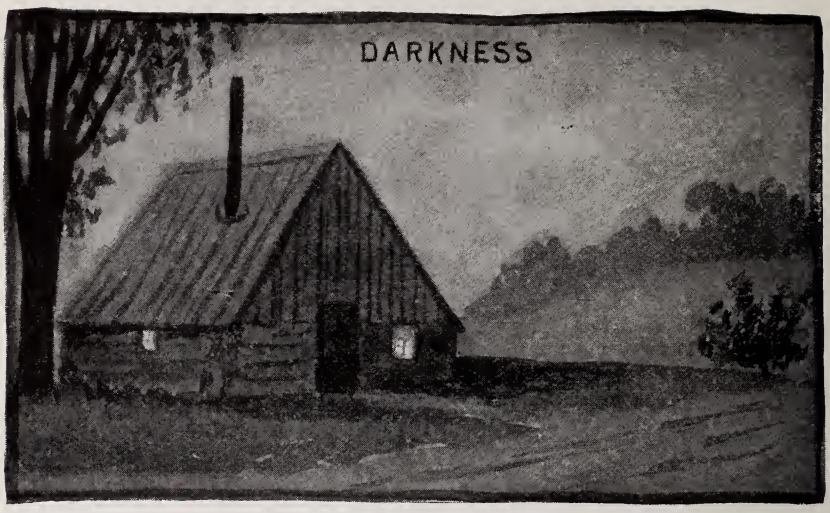


Fig. 13

Drill Exercises

1. Cold Gray or Black. Paint Fig. 12 entirely with cold gray.
2. Cold Gray or Black. Paint Fig. 13 entirely with cold gray.
3. Cold Gray and Warm Gray. Paint the sky of Fig. 12 with cold gray and let the cold gray predominate in the middle distance, but in the foreground let the warm gray predominate especially in the details.
4. Cold Gray and Warm Gray. Paint Fig. 13 the same as Fig. 12 and when dry paint over the whole a heavy wash of cold gray.
5. Violet and Warm Gray. Paint Fig. 12. Let the violet predominate in the sky and middle distance. Make the road and body of the house about neutral; that is, mixing the colors so that neither predominate. Let the warm gray predominate in the ground and large tree and in the details of the house.
6. Violet and Warm Gray. Paint Fig. 13 in the same manner as Fig. 12 and when dry paint over all a strong wash of violet and warm gray letting the former predominate.

COLORED PLATE 3

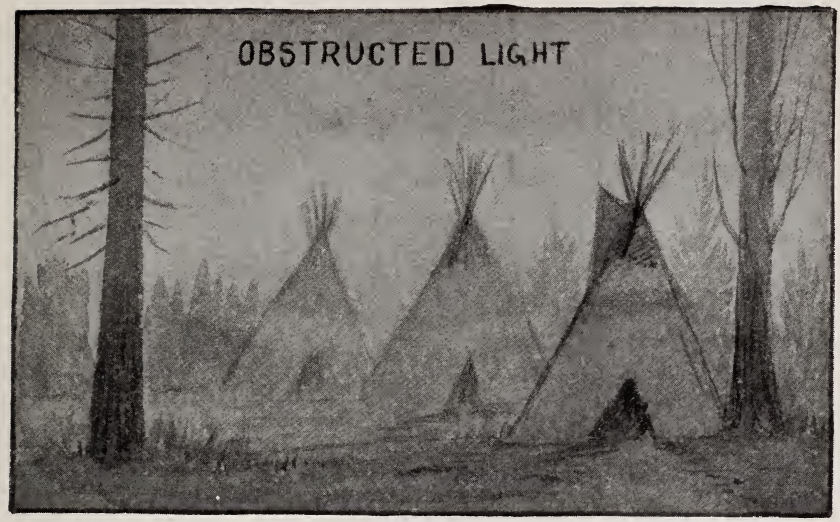


Fig. 14

Obstructed Light. When light is obstructed by a mist, fog, storm, smoke or haze it takes away the details, the distance and the local color, and tends to make all objects of the same value or color. The tones are medium and tend to an even gray color that varies with conditions.

Fig. 14 is an example of obstructed light, of objects seen through a fog. Such drawings may be painted as follows: Place a plain or graded wash over the whole picture. When dry, paint the more distant objects very light and as the foreground is approached paint the objects stronger. If when finished, the objects show too plainly place a wash over the whole.

Drill Exercises

1. Cold Gray or Black. Paint the entire picture with cold gray.

2. Red and Green. Place a neutral wash of red and green over the whole and with the same wash gradually strengthened, paint the trees, wigwam and foreground, letting the green or red predominate according to your judgment.

3. Blue and Orange. Place a neutral wash of blue and orange over the whole. When dry, with the same wash gradually strengthened, paint the various objects using your judgment as to whether the orange or blue will predominate.

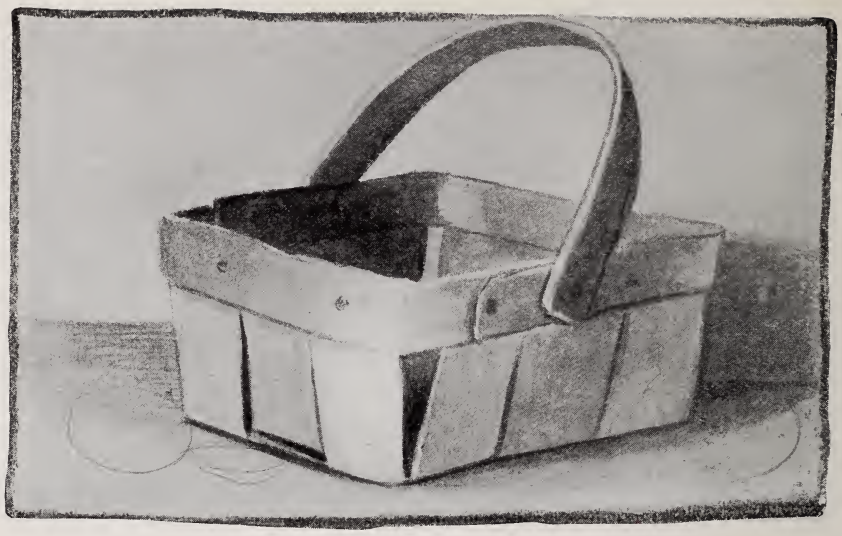


Fig. 15

Object Painting. When painting directly from the object, be guided in form, color and value by the object itself. A diffused light coming over the left shoulder is the best to work in.

Do not, at least at first, try to represent the little details, but rather the broad masses. Colored plate 4 illustrates about the amount of details to represent, and Figs. 15 and 16 show good models to study for first efforts.

Objects Suitable to Paint in Water Colors

Grasses and similar growths, such as the clover, sorrel, flax, oats, alfalfa, rushes and grains, weeds of simple form, sprouting bean, pea, corn, and wheat. Pin the model to a paper background that is similar to the paper on which the drawing is made, and paint direct without drawing and with only a light pencil line to mark directions and the main proportions.

Buds and Leaves. Not more than three buds and leaves on a stem.


COLORED
PLATE 4

Make each spray simple and avoid confusion. Choose leaves with smooth edges. Remember that "simplicity is the supreme excellence."

Flowers should be of one color, like the buttercup, dandelion and violet. If of more than one color, the colors should be distinct and alone. Paint single flowers only. *Remove from the model all parts that are confusing.* Buttercups, pansies, poppies, yellow marguerites, sunflowers, sweet peas, dandelions, iris, marigold, anemone, violets, geranium, narcissus, rosebuds, water-lily buds and many others.

Trees. Excellent models. Aim for the general form and color. Avoid details. All trees are good, but at first choose a single tree standing alone, with the sky, water, or hill for a background, and with thick foliage. Paint one tree a number of times rather than to skip from tree to tree. Do not stand close to the tree when painting it, but far enough to eliminate the details such as the leaves and smaller limbs.

Fruit and Vegetables should be of distinct color, such as a yellow, red or green apple or tomato. Where the colors are blended use the wet wash. Place the object in an L-shape background. Paint one, two or three in a group. One is preferable. Apples, pears, plums, peaches, currants, cherries, grapes, lemons, radishes, carrots, cucumbers, pumpkins, gourds, and bananas are all good, if well chosen.

Common Things should be free from decorations, of simple form and of one color, or, if of more than one color, they should be distinct. Avoid details and confusion. Place with a background as near as possible like the paper on which the drawing is made. Bright-colored pottery, Japanese lanterns, bright, yet plainly dressed dolls, freshly baked biscuit or loaf of bread, a new berry, peach or grape basket, cheese box, etc.

Birds. Mounted specimens are necessary. Must be of simple decided color, few markings, and of simple form, like the bluebird, yellowbird, blackbird, oreole, robin, or bluejay. Butterflies, if of simple markings, are good.

Bits of Landscape. Look for single objects and plainness of background. Look for the big truths such as general color, form values, and character, and minimize the little details that surround the object. Ask, What do I wish to represent? Answer the question and then act. The following will suggest what to look for: A stump, a log, a large stone, rocks, bunch of grass or rushes, corner of fence, an old trough, gate bars, old mill, tower or bridge, foot bridge, bend in the road, shock of corn, wheat or flax, end of wharf, boat at anchor, buoy, any object projecting from the land into the water, such as a point of rocks, old tree trunk or bushes, an old barn, shed, or shanty.

Fig. 16

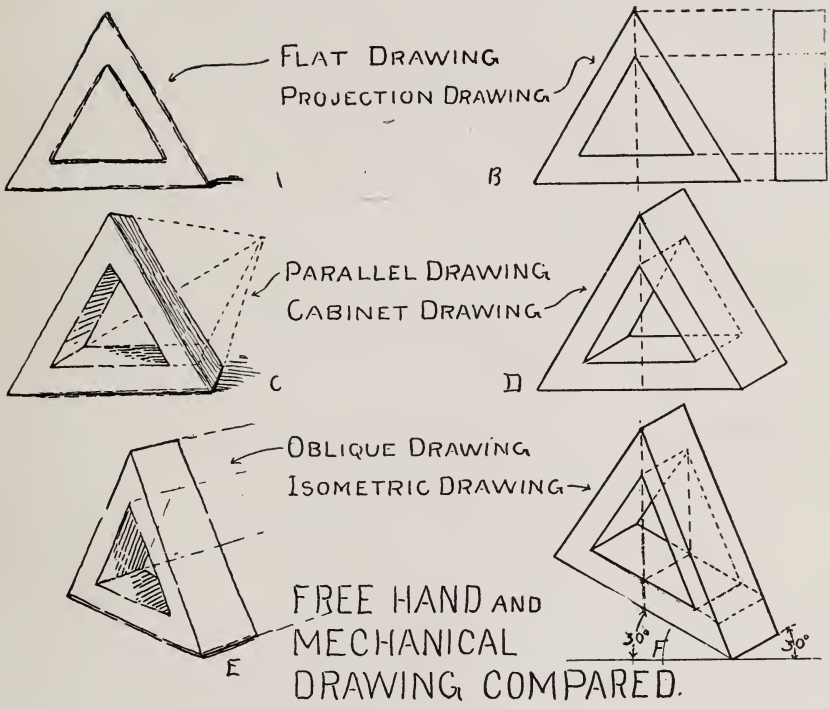


Fig. 1

MECHANICAL DRAWING

Mechanical Drawing is based on Free Hand Drawing. Free hand drawing is divided into Flat drawing, Parallel drawing, and Oblique drawing. Mechanical drawing is divided into Projection drawing, Cabinet drawing, and Isometric drawing. These divisions correspond to one another, as shown in Fig. 1.

Projection drawing and flat drawing are alike in principle, both are drawn as they would appear when directly in front of the eye. In projection drawing, as many views are drawn as will represent the necessary facts. In B, Fig. 1, there are two views of a triangular frame, a front and a side view. Observe that the front view of both kinds of drawing are the same.

The difference between a parallel and a cabinet drawing are that the receding lines in parallel drawing converge to the center of vision and are drawn shorter than the real line of the object, while in cabinet drawing the receding lines are drawn parallel and of true length, that is, if the receding line measures 2 inches, it is drawn 2 inches.

The difference between oblique drawing and isometric drawing is that in oblique drawing the receding lines converge to vanishing points and are drawn shorter than the real lines, while in isometric drawing the receding lines are 30° lines and the measurements are true on the 30° lines and the vertical lines.

Materials. The minimum of materials necessary for Mechanical Drawing are:

A pair of compasses with pencil attachment.

A T square with a blade 9 inches long and upward.

A 45° triangle and a 30°–60° triangle. Small size.

A hard pencil H or No. 3.

A common foot rule.

A tablet of paper $8\frac{1}{2}''$ x $11''$. The tablet should be made with a stiff back, with perfectly straight edges and square corners, and glued on the side firmly. This pad when well made will take the place of a drawing board.

The above outfit is for pencil work only. If the drawings are to be inked, then to the above must be added a bottle of drawing ink, a ruling pen, and a pen attachment for the compasses and an ordinary pen for freehand work.

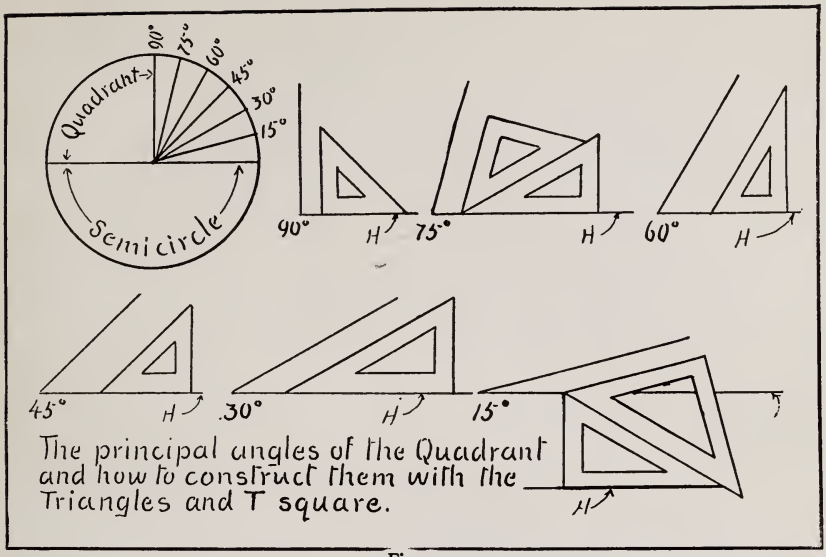


Fig. 2

Angles. A circle is divided into 360°. One half of this circle or 180°, is called a semi-circle, and one quarter or 90°, a quadrant.

The principal divisions of a quadrant are angles 15° apart. They are 15°, 30°, 45°, 60,° 75°, and 90°.

Fig. 2 shows these divisions and how to construct them with the T square and the two triangles. The T square is represented by the horizontal line H, and by placing the triangles on it as shown in the cut these angles may be formed.

Drill Exercises

With the T square and triangles draw the following triangles.

1. Draw on a base two inches long a triangle with 45° sides. What kind of an angle does the apex form?
2. Draw on a base two inches long, a triangle with 60° sides. What kind of a triangle is it?
3. Draw on a base two inches long a triangle with 75° sides.
4. Draw on a base two inches long a triangle with 30° sides.
5. Find out how many degrees are contained in the three angles of a triangle.

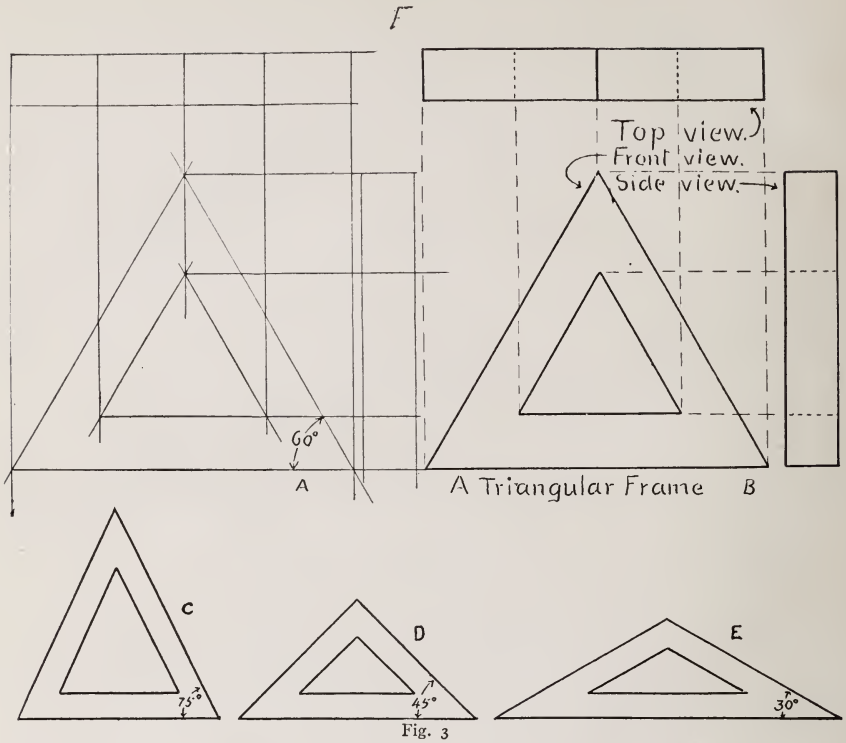


Fig. 3

Projection Drawing. A single projection shows one face of the object represented, the same as in flat drawing, hence there should be as many projections, faces, or views as will show the necessary facts.

In Fig. 3, B represents three views of a triangular frame. A represents the frame marked out with the lead pencil. Light fine lines are used and then it is finished with heavier lines or inked as in B.

Drill Exercises

1. Make three views of a triangular frame with 60° sides.
2. Make three views of a triangular frame with 45° sides.
3. Make three views of a triangular frame with 30° sides.
4. Make three views of a triangular frame with 75° sides.

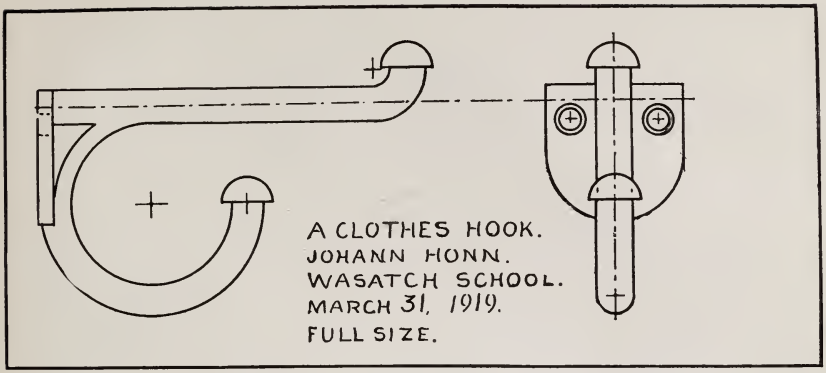


Fig. 4

Fig. 4 represents a full-sized projection drawing of a common clothes hook. Small objects of this kind are perhaps the best for ordinary practice work. The objects must be simple, plain, and free from decorations, and the curves, if any, parts of a circle. The following objects will be found good for this purpose. Plain keys, a whistle, a package handle, a nail, tack, drawer pull, hatchet, hammer, tea-cup, measure, funnel, fish-hook, sinker and similar objects.

In Fig. 4, the crosses represent centers and all measurements are made on or from the center lines.

Drill Exercises

1. Make a projection drawing of a clothes hook.
2. Make a projection drawing of a key.
3. Make a projection drawing of a spool.
4. Make a projection drawing of a whistle.
5. Make a projection drawing of a nail.

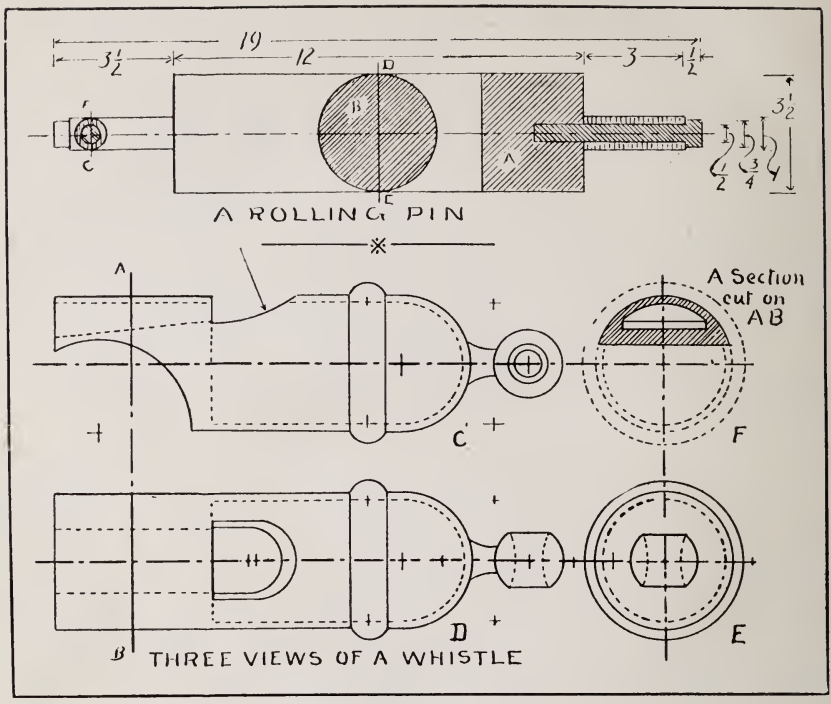


Fig. 5

Methods of Projection. Fig. 5 shows methods in projection.

The shaded portions represent sections. A section represents an object as cut in two. There are two sections, a lengthwise section and a cross section.

A represents a lengthwise section cut through one end of the rolling pin and the handle. In sections the lines of the same pieces or the same kind of pieces have lines in the same direction.

B represents a cross section of the rolling pin as it would look if cut through on the line D E. It is in reality an end view at right angles to the lengthwise section. C represents a cross section of the handle as it would appear if cut through on the line C F.

The white part of the rolling pin is in regular projection. Such a drawing as this saves space, time and connecting lines.

The figures above the rolling pin represent lengthwise measurements, and the figures $\frac{1}{2}$, $\frac{3}{4}$, 1 and $3\frac{1}{2}$ at the right indicate the diameter of the peg, of the head, of the handle and the rolling pin. When all the figures are in inches it is unnecessary to use the sign.

The whistle shows another way of representing the inside of an object. The dotted lines show the inside of the whistle.

C represents the side view; D the top view, and F is a cross section cut on the line A B. The crosses represent centers from which the circles, and parts of circles, are drawn. Measurements are made on or from the center lines. The connecting or projecting lines are omitted.

It is not practical or possible to draw all objects the exact size. Large objects are drawn smaller than they measure, but they should always have the same proportion. Maps are many times smaller than the country they represent, yet if the scale of the drawing is known, it is easy to tell how far it is from place to place.

The rolling pin is 19 inches long, but it will not measure that distance. This is because it was drawn to a scale. That is, one inch on the real rolling pin was represented by one-fourth of an inch in the drawing, and this has been further reduced by the engraver.

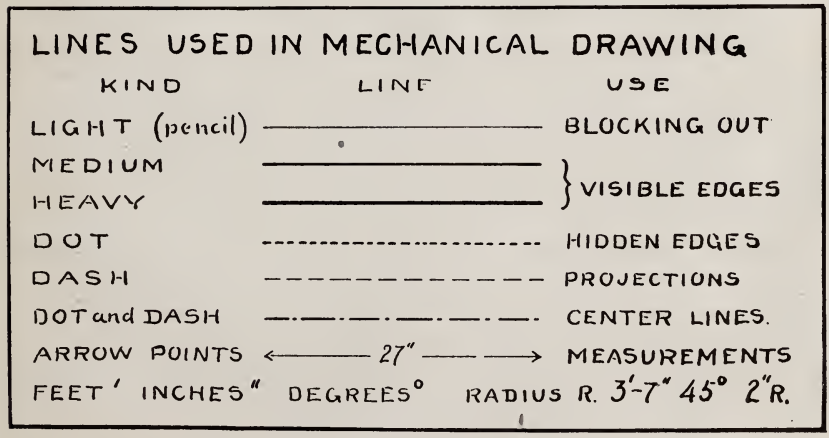


Fig. 6

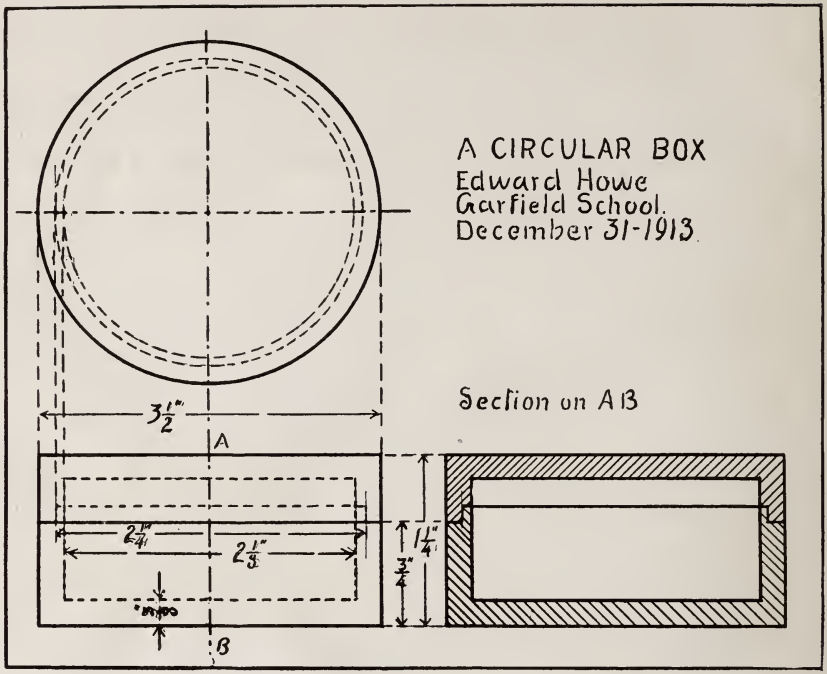


Fig. 7

Fig. 7 represents two views and a section drawing of a round box. The following are some of the objects that can be drawn in a similar manner. A plain tumbler, a tin funnel, round and rectangular boxes of various sorts. A small flower pot, small bottles, almost any plain object free from decorations, and that contain few lines and parts. They should be drawn full size until some facility is gained in representing the parts and then larger objects and a scale of $\frac{1}{2}$, $\frac{1}{4}$, or $\frac{1}{8}$ may be used.

Mechanical Sketching. The ability to sketch an idea in projection or section, without the aid of instruments, is perhaps one of the most desirable attainments for the mechanic or any person. To represent an idea easily, quickly, and with some degree of accuracy, is more to be desired than the slower and more laborious drawing made with instruments. Facility is sometimes more than accuracy.

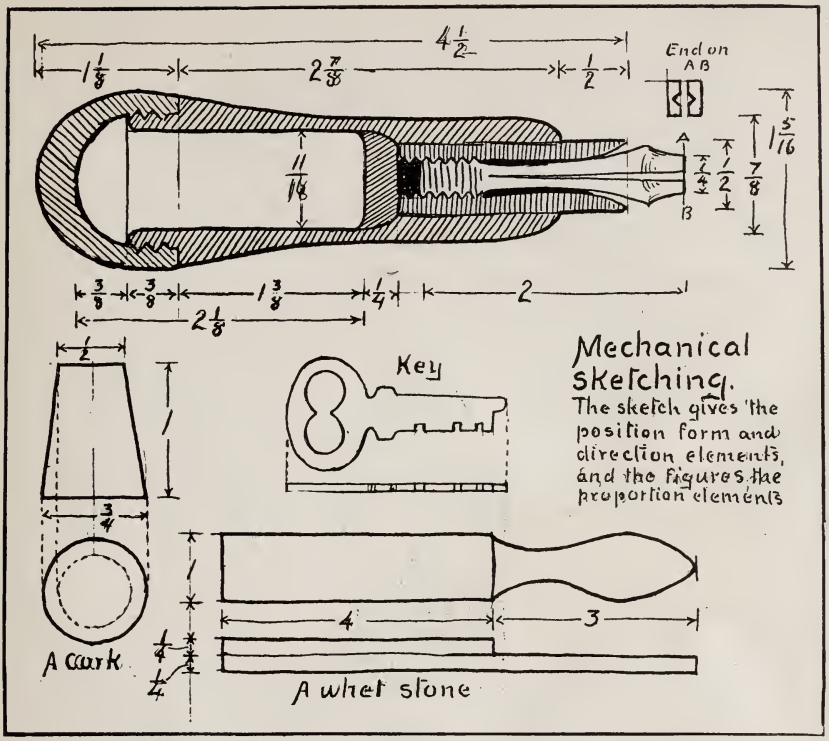


Fig. 8

The aim in this work is to give the idea by means of the drawing, and show the accuracy by the figures indicating the measurements. The measurements are made accurately, but the drawing may or may not be exact. For example, in Fig. 8, the drawings are but offhand sketches that give a more or less clear idea of the object. They represent the position and form of each part; also the direction more or less accurately, but reliance is placed on the figures to give the size or proportion. Finished drawings may be made from these sketches. It is usual among draughtsmen to make preliminary sketches with accurate measurements, before making the finished drawing.

Drill Exercises

1. Make a mechanical sketch of a cork, eraser or key.
2. Make a mechanical sketch of a wrench, bottle or knife.
3. Make a mechanical sketch of a book, box or block.
4. Make a mechanical sketch of a cup, mug or measure.
5. Make a mechanical sketch of a tack, nail or screw.
6. Make a mechanical sketch of a table, bench or desk.

Both Cabinet and Isometric drawing are excellent for this work .

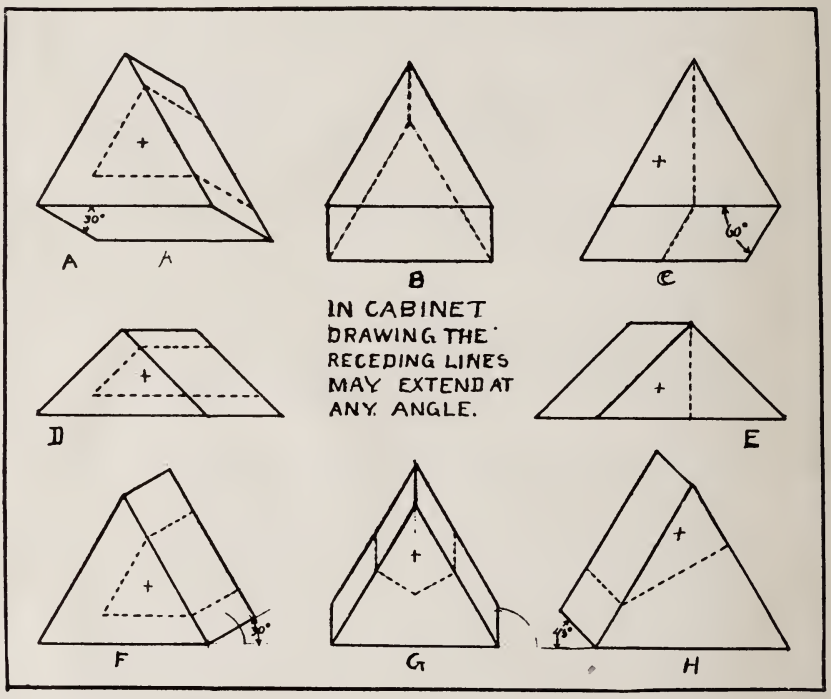


Fig. 9

Cabinet Drawing is the same as parallel drawing except that the receding lines are drawn parallel, and of true length as shown in D, Fig. 1. Parallel drawing is taught in the Fourth and Fifth Year Books.

In cabinet drawing all measurements on the vertical planes (front and back faces) and the main receding lines are true. All the lines in Fig. 9 are true lines. True lines are those that measure the same as on the real object.

The receding line of cabinet drawing can be extended in any direction or angle.

The eight positions of the triangular prism are the same as those used in parallel drawing. See Fourth Year Book, cut 19, in Form.

In A, B, and C, Fig. 9, the receding lines slant downward at an angle of 30°, 90°, and 60°, D and E are horizontal and F, G and H slant upward at an angle of 30°, 90°, and 45°.

On each prism except B there is a part marked X, which is to be removed as indicated in the drill exercises. The problems in A, D and F are the same, likewise in C and E.

Use the T square and the 30°–60° triangle to construct A, B, C, F, and G. Use the T square and the 45° triangle to construct D and E, and use all three to construct H.

Drill Exercises

1. Draw triangular prism A and remove X.
2. Draw triangular prism D and remove X.
3. Draw triangular prism F and remove X.
4. Draw triangular prism B.
5. Draw triangular prism G and remove X.
6. Draw triangular prism C and remove X.
7. Draw triangular prism E and remove X.
8. Draw triangular prism H and remove X.

One of the chief advantages of cabinet drawing is that circular and curved lines can be represented on the front face in true measurement In Fig. 10, is a triangular block to hold a shaft in place. It is drawn in its most simple form with the complicated parts omitted. C and D represent the same idea in different form and directly in front of the eye. They may be represented at any angle shown in Fig. 9.

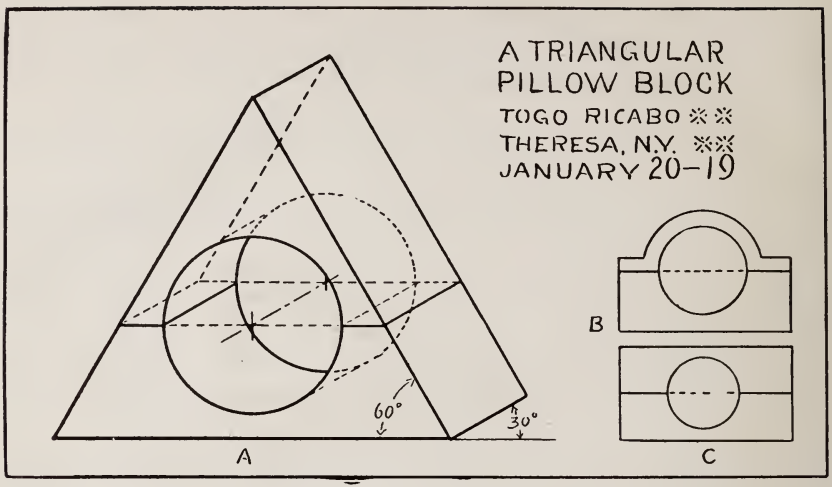


Fig. 10

Drill Exercises

1. Draw a triangular pillow block similar to A.
2. Draw a triangular pillow block similar to A with the top part removed.
3. Draw a triangular pillow block similar to A and remove the lower part.
4. Draw a pillow block similar to C with the receding lines at an angle of 30°.
5. Draw a pillow block similar to C with the top removed and at an angle of 45°.
6. Draw a pillow block similar to B at an angle of 30°.
7. Draw the top part of the block B at an angle of 60°.

Isometric Drawing. The advantage of Isometric and Cabinet drawing is that they combine much of the intelligibleness of the picture, and the exactness of the projection. They also possess the advantage of being more readily understood by those unacquainted with drawings of plans and elevations.

Isometric drawing differs from oblique drawing from which it is derived, by having the receding lines confined to 30° lines, and making all measurements on these lines true.

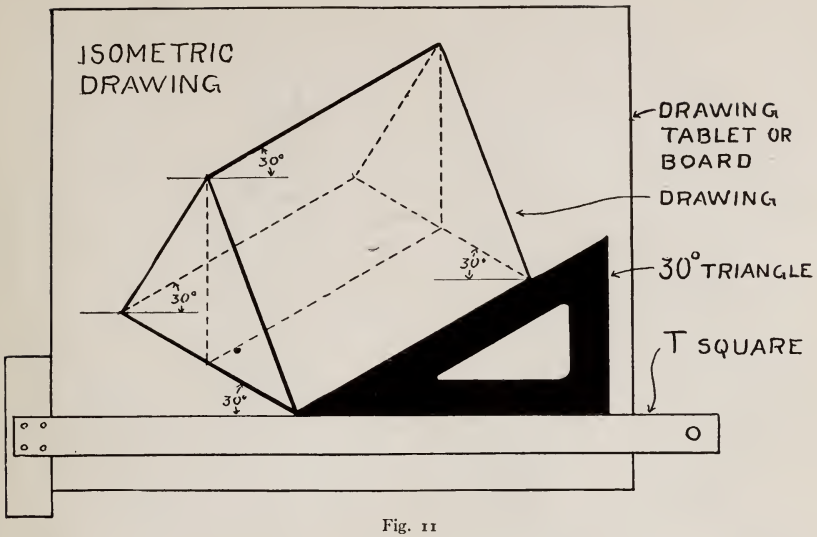


Fig. 11

In Isometric drawing the T square and the 30° triangle are used together, as shown in Fig. 11. All right angles are made with 30° lines, or 30° lines and vertical lines. (The vertical lines are in reality 30° lines that slant directly away.) The lines are made 30° from the horizontal edge of the T square. All measurements in isometric drawing are made on the 30° or vertical lines. All other measurements are not true.

A, Fig. 12, represents an isometric drawing of a triangular prism. Lines marked 1 are 30° lines and those marked 2 are vertical lines. On these lines alone are the measurements true. Lines marked 3 and 4 are neither vertical nor 30° lines, hence measurements on them are not true. For example, lines marked 3 represent lines equal in length to lines marked 4, but they are not drawn equal.

Draw the triangle in the following order. First, the 30° lines of the base. Second, the vertical lines and the 30° line marking the apex. Third, the side lines.

Do not use a model for these exercises, but depend entirely on the principle, and use your own measurements.

C, D, E and F represent right triangular prisms and G, H, I and J

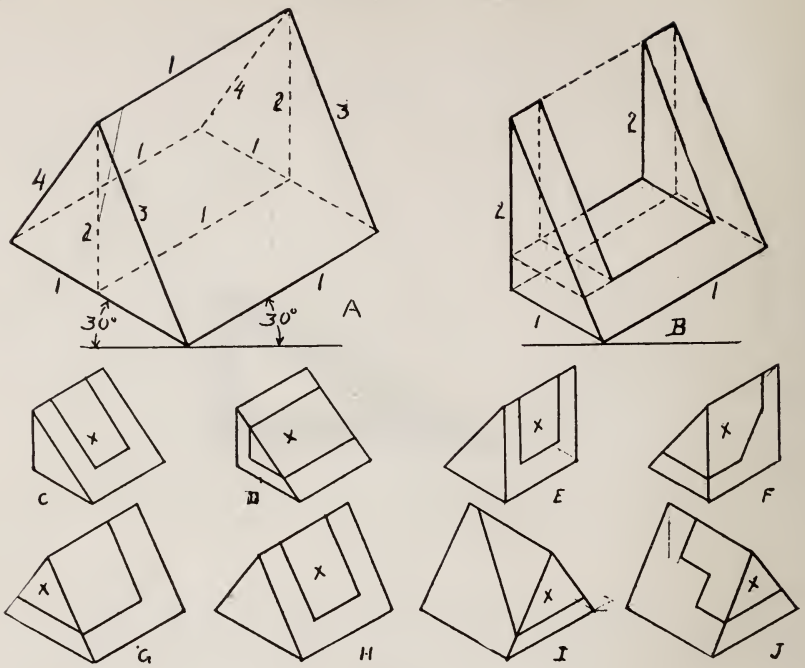


Fig. 12

acute triangular prisms. On each is a part marked X which is to be removed as indicated in the drill exercises. B shows exercise C with X removed.

Represent in the finished drawing all the lines both seen and unseen as shown in B.

The horizontal lines mark the edge of the T square.

1. Draw triangular prism A.
2. Draw prism C and remove the part marked X.
3. Draw prism D and remove the part marked X.
4. Draw prism E and remove the part marked X.
5. Draw prism F and remove the part marked X.
6. Draw prism G and remove the part marked X.
7. Draw prism H and remove the part marked X.
8. Draw prism I and remove the part marked X.
9. Draw prism J and remove the part marked X.

The New Augsburg's Drawing